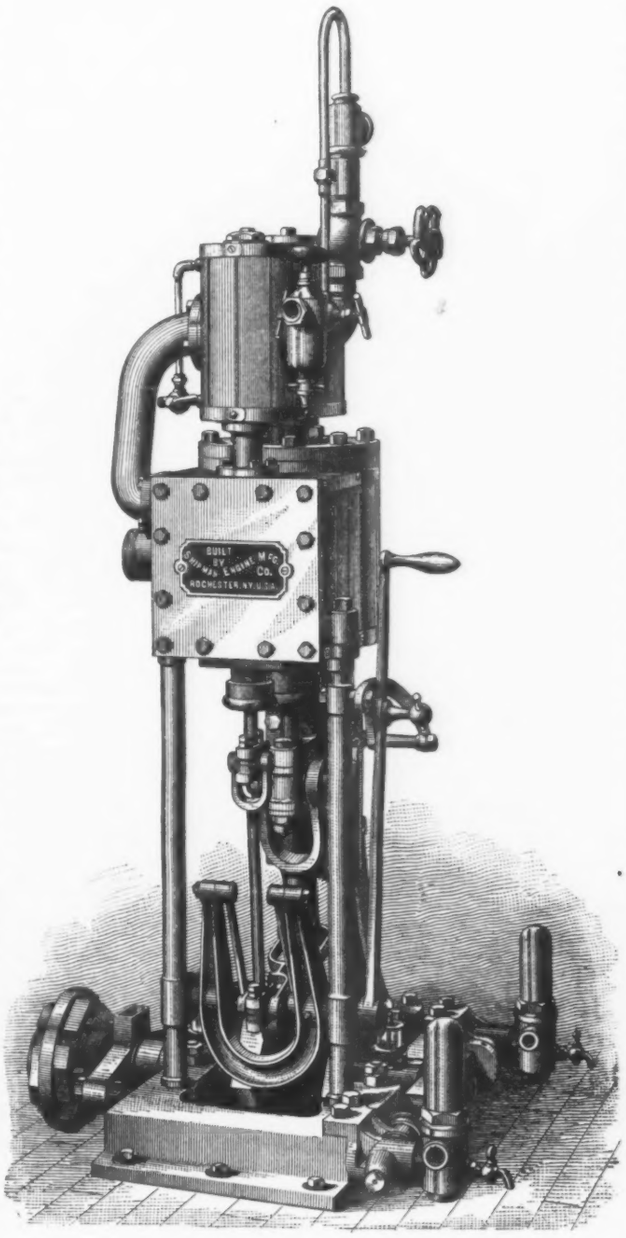
THE IRON AGE

THURSDAY, SEPTEMBER, 5 1889

Eight Horse-Power Steeple Compound.

The accompanying engraving illustrates a "steeple" compound engine having high-pressure cylinder 3½, low-pressure cylinder 6, and stroke 5 inches, manufactured by the Shipman Engine Company, of Boston, Mass. The engine is especially designed to economize room, both over the ordinary steeple compound in hight and the common fore-and aft compound in length, being especially desirable where a maximum of power is wanted in a small boat with the least possible amount of space occupied. The engine and boiler designed to accompany it make a complete plant which occupies but little room in comparison to the power developed.



Eight Horse-Power Steeple Compound Engine.

As will be seen from the cut it is a single "gib" engine, having large steel columns to support the other side of the cylinders, and is fitted with the Joy patent reversing gear, which obviates the use of eccentrics, eccentric straps, &c., is almost noiseless in operation and gives the best results. The reversing lever is fastened to the bar by a small hand screw, and may be placed at any point on it, thus giving the engineer the advantage of "cut-off" at any part of the stroke he may wish.

The valves themselves are of the piston type on the high-pressure cylinder and of the slide pattern on the low-pressure cylinder. It will also be noticed that there are but two stuffing-boxes, one on the valve-stem and one on the piston-rod. This fact will be appreciated by users of this style of engine who have heretofore been obliged to take care of six stuffing-boxes. In the space between the high and low pressure cylinders, formerly occupied by the other form of stuffing-boxes, there are placed two long brass bushings, each scored by two rings. Tests show that there is little or no leakage between the two cylinders. The crank-shaft is in one piece and is made of cast-steel, the crank-pin placed between balanced disks, the size of shaft being 1¼ inches. The feed-water pump for the boiler and the air-pump for condenser are driven from one pin on the end of shaft, the two being connected by a "yoke." The wrist-pin and crank-pin have each split boxes of composition, and all other wearing parts are provided with means for the taking up of "lost motion." All heavy running parts, such as the shaft, wrist-pin, crank-pin and slide, are fitted with oil-cups. The cylinders are neatly lagged in black walnut bound with brass bands.

The Central Traffic Association will advance rates on iron and steel September 16. The rate between Buffalo and Chicago on less than car lots will be 17½ cents and on car lots 15 cents; pig-iron rates $2.50 per ton from Pittsburgh to Chicago and $2.20 from the Mahoning Valley. The advance is about 25 per cent. by altering the classification. The freight committee of the Mahoning and Shenango valleys met at Cleveland and arranged the iron tariff in conformity with the new basis adopted at Chicago, $2.20 per ton on pig-iron from the valleys to Chicago. Rates from the valleys to Cleveland were fixed at 80 cents for pig-iron and 4 cents manufactured iron, and to Pittsburgh 80 cents pig-iron and 5 cents manufactured From the valleys to Boston the rate September 3 will be 20 cents and 23½ cents carload and less than carload lots manufactured iron and $4 per ton pig-iron. That will make the Cleveland rate on manufactured iron to Boston 21½ and 25 cents carload and less than carload respectively. The old iron tariff from Cleveland was re-established.

Stone-Sawing with Helicoidal Wire Cord.

The *Journal Society of Arts* describes a method of cutting stone by means of sand carried by a helicoidal wire as practiced by M. Paulin Gay, of Marseilles. A continuous wire cord, varying from $\frac{5}{32}$ to $\frac{7}{32}$ inch in diameter, is composed of three mild-steel twisted wires and is moved at a speed of from 15 to 17 feet per second. This wire, which is of any desired length, is led to the stone, being guided by grooved pulleys mounted on universal joint bearings which permit their adapting themselves to any change of direction. The cord is kept taut by a weighted truck moving on an inclined plane.

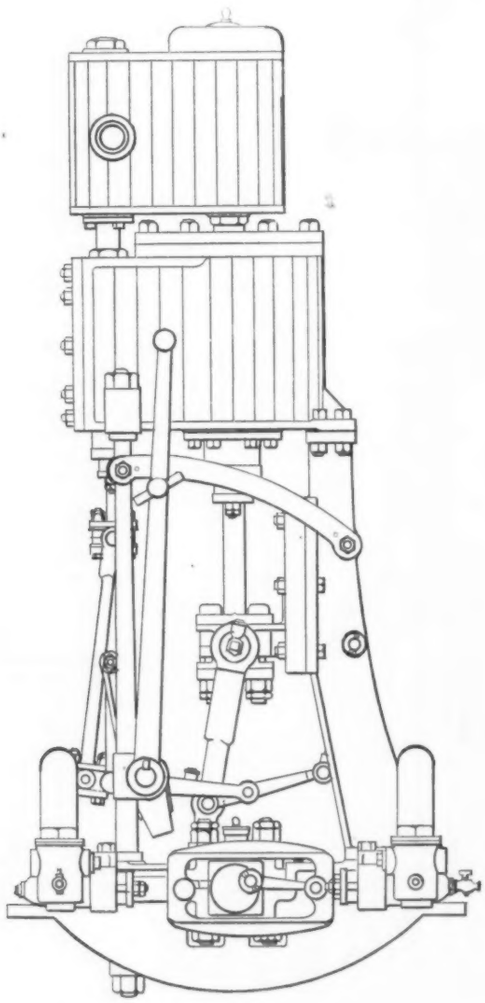
The pulleys are mounted in standards and are fed down by endless screws rotated automatically if the stone be uniform, but preferably by hand if there is reason to suspect irregularities in its texture. Sand and water is allowed to flow freely into the cuts, the sand carried along by the cord into the spiral interstices between the wires causing a uniform attrition of the stone. The twist of the cord causes it while traveling to turn upon itself and thus become worn evenly. A cord of average length, say 150 yards, will cut about 70 feet deep in blocks 15 feet long, or produce 490 square feet of sawn surface before being worn out, when it may be used for fencing.

The sand must be sharp and not used more than three times. The nature of the sand is determined by the hardness of the stone; thus quartz sand will cut granite and porphyry, which it has hitherto been found impossible to saw, or, indeed, cut in any other way than by pick or chisel. An hourly advance of 1 inch in granite or porphyry and 4 inches in marble is regularly obtained in blocks of 15 or 16 feet long. At the Brussels Exhibition of last year, where the system was awarded a First Prize of Progress, the same cord which cut marble also cut a block of concrete composed of quartz pebbles.

Not merely does the helicoidal cord saw blocks of stone, but it even cuts them out of the solid rock in the quarry. To do this it is necessary to sink shafts of 2 feet or 2 feet 6 inches in diameter, in order to introduce the pulley-carriers. If there is a free side to start from one shaft is sufficient for a triangular block; but for a quadrangular one, which is preferable, two shafts are necessary. They are bored by a mechanical perforator, consisting of a hollow-plate iron cylinder, having at its lower end a slightly thicker collar which acts with sand and water in its latest development. The cylinder is made to revolve at a speed of 140 revolutions a minute, by means of a tele-dynamic cable, advancing about 1 inch per hour in marble. An annular space is cut in the rock,

leaving a core, which may be utilized as a column. The diameter of the shaftway depends upon the diameter of columns most in demand, provided a sufficient number be sunk and the intervening angles broken down, so as to afford sufficient room for the pulley-carrier.

In the case of stratified rocks, the shaft-cuts are carried down to a natural parting, but in unstratified rocks a nearly horizontal cut may be made with the cord, sufficient inclination being given to insure the flow of sand and water to the bottom of the cut. Such is the method of working practiced at the Traigneaux Quarry, near Philippeville, in Belgium, where 15,000 cubic feet of marble are extracted yearly with a 30 horse-power engine and only 30 hands in summer and 20 in winter, besides the lads who tend the wire cords.



Side Elevation of Steeple Compound Engine.

The system is also employed at granite and marble quarries in France, Germany, Spain, Italy, Algeria, Tunis and other countries, where it is said to be giving satisfactory and economical results.

Six Hundred Thousand Dollars for a Share of Stock.

In a London auction room a few weeks ago a remarkable sale was effected. Described as "one entire and undivided share in the Adventurers' moiety of the estates and interest in the New River," it was a lot such as had never before been submitted to public competition since this river was finished. Finished is the right word for the fact, because the river was virtually the creation of men's hands. It was finished in 1613, and its shares were then sold for £100 each. Portions and fractions of shares have since been sold, but only at rare intervals. Prices have steadily gone up for these fractions, until in 1878 a certain fraction was sold at the rate of £91,000 for a whole share. This was an advance from the original price of $500 to $455,000. At the sale a few weeks since the price had advanced still further, the enormous sum of £122,800, or $614,000, having been paid.

New River dates from 1608, and owes its existence to one Hugh Myddelton, a simple citizen and goldsmith of London, who was afterward made a baronet for the success of his enterprise. It is the distinction of New River that it furnishes London with water. At this late day more than one-fourth of the city's supply comes from New River. Some springs and chalk wells 20 miles north from London furnish the water for this stream, which flows down to the great reservoirs, 40 acres in extent, at Stoke Newington, and thence to New River Head, near Sadler's Wells Theater. Thence the water is carried direct to other parts of London or to high-level reservoirs in Claremont Square and at Highgate. Originally there were 72 shares, half of which belonged to Hugh Myddelton and the other half were taken by James I, who in 1613 gave Myddelton his title. King James' shares were afterward sold by Charles I to the second Sir Hugh Myddelton for a fixed payment of £500 per annum, which is still continued. The net return on these 36 shares for the past year amounted to £93,960, or nearly 200 times the fixed payment.

The dividend in respect to the share recently sold for the year ending Christmas last was £2610, but the value of the share is greatly increased by the reversionary interest which it carries to "important future accretions." The nominal capital of the company, as shown by Parliamentary returns, amounted at December 31, 1884, to £3,369,933. In 1869 the receipts for water amounted to £268,238, and in 1888 they amounted to £511,356. The receipts depend upon the annual value of the properties supplied, and are not dependent upon the amount of water consumed. The company have the exclusive right of supplying water to fill the northern suburbs, including Hampstead and Highgate, the whole of the city of London proper, a large part of Westminster, wealthy parishes at the West End and more distant parts of Middlesex and Hertfordshire. In addition to this magnificent source of revenue there are estates belonging to the company which embrace considerable tracts of land and important properties in the counties of Middlesex and Hertford, various premises in the city of London, and the Myddelton-square estate, which comprises about 50 acres in the very heart of the metropolis, for the most part covered with buildings the leases of which expire in about 20 years, when the company come into possession of the rack rents. In addition to all this a bonus is occasionally declared, one in 1874 being at the rate of £1008 on each share. The acquisition of the share sold entitles one to a seat at the board.

The auctioneers called the sale an "unprecedented auction," and that description was justified. The room set apart for the sale was crowded in every part. "No such sale," said the auctioneer, "as an entire share has occurred during the three centuries the New River has been in existence. Therefore I think I am justified in describing it as an unprecedented auction. There is a clear title for 52 years, which is good enough for anything. We have been solicited to sell this property by private contract, but having taken time to consider we have determined that the property should go by public auction, and we have refused the offers made to us. I leave the property absolutely to you. Practically this is an unreserved sale. What is your price for this particularly unique freehold estate, with its income of £2610 a year up to last Christmas, which income has doubled within 20 years?" A voice, "£80,000." The auctioneer, "Thank you. Now, what is the next offer?" A voice, "£81,000;" another, "£85,000;" another, "£90,000." The *Standard's* account says the bidding then advanced by £1000 at a time to £95,000; then a pause. After some further remarks from the auctioneer a bid was offered of £96,000. Then other voices, "£97,000," "£98,000;" in two places, £99,000," "£100,000." Then the biddings advanced by sums of £250 and by hundreds up to £102,000. Then a pause. There appeared to be five groups bidding at this time, and the price ran up by a hundred at a time, as fast as the auctioneer could count, to £119,000. Then one or two groups became silent, and still the bids went on by a hundred at a time and sometimes by leaps of £300 and £500, until £122,000 was offered amid cheers. "Go on," said the auctioneer, but all the would-be purchasers had nearly done, and in a few moments the share was knocked down, amid considerable excitement, for £122,800 to Mr. W. J. Lancaster, secretary of the Prudential Assurance Company.

When Hugh Myddelton, the Welsh jeweler, determined to provide the then circumscribed city with water, the first requirement of life was both poor in quality and scarce in quantity. The supply was mainly derived from two or three conduits in the principal streets, a few in the north-

ern suburbs, and the springs in the neighborhood of the Fleet Ditch. Leaden tubes bore the water from these conduits to various points, and the city records contain an entry of how a dishonest citizen was punished for tapping the pipe where it passed his door and surreptitiously diverting the water to his own well. Hugh Myddelton resolved to bring an ever-flowing stream—a New River, as the town termed it—from the clear springs and wells and streams of Hertfordshire. Finding, when the water had been brought as far as Enfield, that his own resources were unequal to the cost of completing the enterprise, the "Adventurer" besought help of the King, on the understanding that his Majesty should, by paying half the outlay, receive half the profits. In this way originated the "coveted King's shares." James' money did more than supply the means of digging the reservoirs and the ditches. It silenced the opposition which otherwise might have defeated the object of the active-minded jeweler. Even after the water was got into the city, with much pageantry and some bad poetry, nearly 276 years ago, the profits of Myddelton and his royal partner were meager in the extreme.

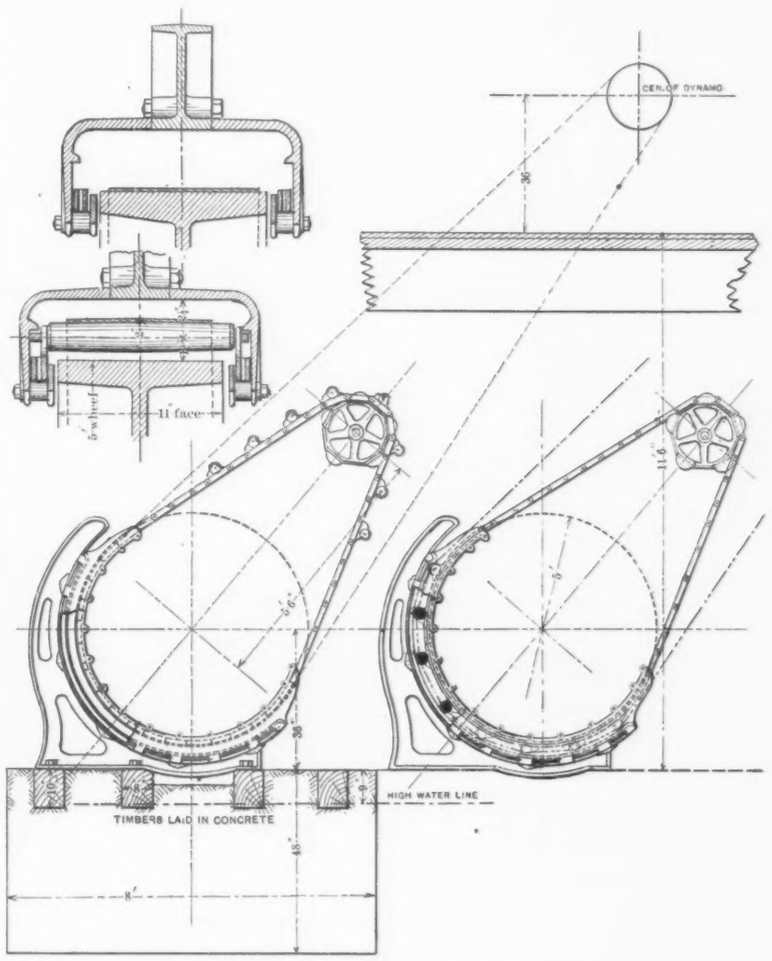
With "classes" and "masses" arrayed against him, it is not to be wondered that for a time the London jeweler had to stick to his shop more closely than ever, and that the sanguine King began to have his doubts of the promised fourfold return for his "gude Scots merks." There is, indeed, still extant a legend to the effect that Myddelton ruined himself, and after a life of want, unrelieved by the bounty of the corporation, died a pavior in a Shropshire village. In reality, he lived to the year 1631 as a prosperous gentleman, though his income was not derived to any great degree from the revenue of his New River. For a long time after the works were completed the water was used to only a limited extent. For 19 years the annual income was barely 12 shillings a share. In 1634 one might have been had for a very moderate price, since its income did not amount to more than £3. 4/2, while its profits were practically *nil*. By 1636, after a bad year or two, each moiety brought only £115. 10/ of profit, and toward the close of the last century the return was no more than £431. 8/8. As late as the second decade of this century a share was thought to have attained an extravagant figure when it fetched £11,500 at auction.

But of all the original 72 shares, none is nowadays in the hands of either the "Adventurer's" or the King's descendants. The last Sir Hugh Myddelton died so poor that his mother subsisted on a pension of £20 a year from the Goldsmiths' Company. It will be seen, then, that all the wealth of the New River has been of recent growth.

Our attention has been called to errors of statement in our comments on the exhibit at Paris of the American Screw Company, of Providence, R. I. The most serious grew out of a typographical error, through which we made it appear that the rate of rolling was 60 screws a minute, against 70 screws in cutting, when we had written seven for the latter. We are informed that the figures stand 53 for the rolling, while a cutting-machine will rarely average five a minute of the same size. The statement made in our comments has been misinterpreted: "The leading principle which is followed throughout the work is that any effort to force the metal to assume the shape intended is found to result in failure. It must be carefully coaxed by causing it to flow naturally." What we intended to express was that any effort to do violence to the metal when forcing it to assume the shape intended results in failure, that the work must progress in the direction indicated by its natural flow. The results obtained by the American Screw Company prove to what length it is possible to go in shaping metal by cold rolling. It proves, too, that success can be attained only by treating the metal in the right way.

Belt-Shifter.

From a paper read by J. T. Henthorn and C. R. Remington at the recent convention of the National Electric Light Association, on the new central station of the Narragansett Electric Lighting Company, Providence, R. I., we take the following description and accompanying drawings of the belt-shifter there used:



Belt-Shifter.

The device adopted for shifting the dynamo belt is such that loose pulleys and clutches are entirely dispensed with, the pulleys being rigidly secured to the shaft. The arrangement consists (for each dynamo-driving pulley, the same being 60 inches in diameter) of a curved standard or frame secured to and extending up from the floor somewhat above the center of the shaft. Each side of the frame is provided with a series of narrow guide-rolls, the centers of which are arranged in a half circle whose diameter is somewhat less than that of the pulley, the curved frame in cross-section being U-shape; the pulley continuously revolving in the space lying between the two sides. To the rear of the 60-inch pulley, between it and the dynamo and intermediate of the upper and lower sides of the belt, is mounted a short shaft parallel with the main shaft, having two chain wheels thereon, separated from each other by a distance exceeding the width of the pulley. Two endless chains (made up of flat links) are carried by this shaft and supported by the guide-rolls before referred to. A portion of the chains, or flexible apron, is provided with 2-inch wooden rolls, the same extending across and uniting the two chains; the under side of the rolls being some ½ inch or more above the periphery of the pulley when the belt is shifted.

In order to shift the belt the dynamo is first operated by the usual screw or equivalent device to slacken the belt somewhat, to be immediately followed by operating a lever which carries the wooden rolls ahead from the normal position, thereby engaging the inner face of the belt, and as the chain advances lifts the belt radially away from the pulley, the belt then being stationary and the pulley revolving. To start the dynamo the operation is reversed—that is, the flexible apron is revolved rearwardly, thereby carrying the rolls from the proximity of the pulley and allowing the belt to re-engage the pulley, the dynamos at the same time being actuated to tighten the belt.

Mr. Licht's report on the beet crop gives the following estimates for 1889–90, based on previous years' root and sugar yield: Germany, 1,030,000 tons; Austria, 630,000 tons; France, 505,000 tons; Russia, 500,000 tons; Belgium, 145,000 tons; Holland, 47,000 tons; other countries, 58,000 tons; together, 2,915,000 tons, against 2,735,000 tons in 1888–89, 2,451,950 tons in 1887–88, 2,730,206 tons in 1886–87, and 2,219,073 tons in 1885–86.

The Illuminated Fountains at the Paris Exposition.

The cheap facilities offered for brilliant illumination since the perfection of electric lighting have aided to make exhibitions attractive at night where formerly visitors were limited to day-time. In fact, it is not too much to say that the popularity of recent shows, particularly in Europe, has been largely due to the brilliant spectacle offered by profuse illumination. It is not surprising, in view of the love of the average Parisian for out-door evening enjoyment, that the managers of the great exposition made efforts to outdo any achievement in that direction. Following in the footsteps of the English, who made illuminated fountains a feature in the exhibition in London in 1884, in Manchester in 1887 and in Glasgow in 1888, they introduced them on a grand scale. Coupled with the lighting of the cascades of the Trocadiro and the blaze of light from the Eiffel Tower, the illuminated fountains, which stretch from the latter to a point near the main entrance of the exposition buildings, constitute a dazzling picture. They have certainly proved a wonderful attraction. Your correspondent has noted crowds occupying seats there hours before their playing began, content to wait patiently in the blissful certainty that they would have an unobstructed view. The fountains consist of a group by Coutan of heroic size, from which a series of jets issues, others falling into the basin from the urns at the base of the statues ornamenting its sides. The water drops, in a cascade 120 feet wide, into a lower rectangular basin representing a river, twelve smaller fountains rising in it along the sides. Thence it flows into an octagonal basin in the center of which is a large fountain composed of one great central jet around which play six smaller fountains, the whole surrounded by ten lower jets. The effect produced by converting all these jets and cascades of sparkling water into columns glowing alternately in the most delicate colors of the rainbow cannot be described. It possesses a fascination which few can escape. Your correspondent has seen tens of thousands, fascinated for hours, struggling good-naturedly to obtain a better view. Small as it is, the fountain in the court of the Grand Hotel at Paris has a similar power of attraction, especially to Americans, to the majority of whom it is a novel sight. In all the exposition fountains there are 48 distinct jets. The methods employed to make every one of them appear like a glowing mass of water issuing from darkness are interesting.

Single isolated vertical jets or groups of jets are arranged in the manner shown in Fig. 1. The supply-pipe is carried along over a glass plate placed a trifle higher than the level of the water in the basin, an arrangement which applies to all those parts of the fountains which arise from the water in the basin. The light is thrown into them from below, an electric arc light being placed under it with a reflector, which throws the rays in a direction approximately parallel. The light, when it once gets into the jets, follows their curves, because by the laws of reflection it cannot escape. Between the electric light and jet are interposed sheets of colored glass. The arrangement shown in Fig. 1 is that of Galloway & Sons. The French firm Sautter, Lemonnier & Co. use the plan shown in Fig. 2. Instead of the horizontal hand-regulated arc of the English firm they use the vertical automatic type. A reflector placed at an angle of 45° throws the light upward.

The most interesting and novel part of the work was the problem of lighting the parabolical jets issuing from the horns of plenty and dolphins' mouths of the central statuary and the bases of the urns. It is based on Colladon's experiment, but it was soon found that with the intense light used and the great dimensions the jet could be illuminated for only a short distance. Investigation proved, however, that success could be obtained by throwing the beam of light into the center of an annular jet of water, as shown in Fig. 3, an elliptical form being finally adopted. It was found that a jet nearly ¾ inch thick could be illuminated falling from a hight of nearly 15 feet. It is remarkable how thin the annular body of water may be without allowing any of the light to escape. The general arrangement adapted for these horizontal jets is shown in Fig. 4.

In order to hide from the spectator the source of the light and thus make the illusion complete, the lower parts of the jets are surrounded by an ornamental cast-iron ring, shown in Fig. 2.

Five sets of colored glass are interposed between the electric lights and the jets of water. All of them are connected, so that they can be moved simultaneously by handling a lever at the central station. Figs. 5 and 6 show a plan of the great fountain in the lower basin and a section through the subterranean chambers solidly constructed in Coignet cement. It indicates the lines by which the colored glasses are handled and shows the positions of the different lights, forming a group of 18, while the total number of powerful lights is 48, 30 being arranged at other points.

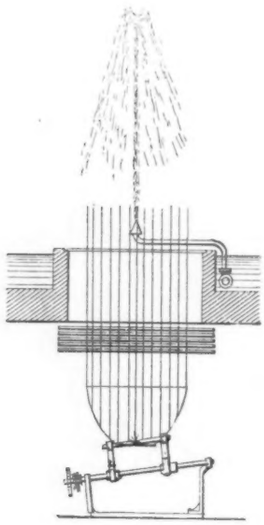


Fig. 1.

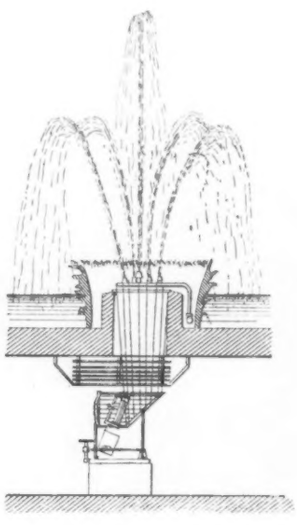


Fig. 2.

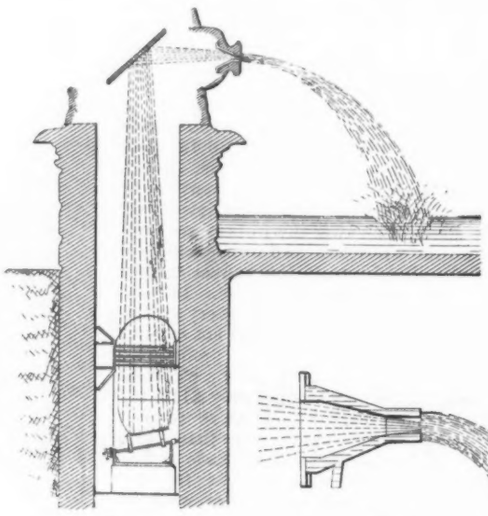


Fig. 3

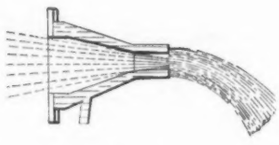


Fig. 4

THE ILLUMINATED FOUNTAINS AT THE PARIS EXPOSITION.

The Work at Watervliet Arsenal.

From a recent issue of the Albany *Argus* we take the following notes regarding the work being done at the Watervliet Arsenal:

FOUNDRY AND SHOPS.

The present foundry, or shop, was built for a lumber shed, but it is large and very substantially built and has served very well the purposes to which it has been put. It is long and narrow, extending nearly north and south. Through the middle runs a track, and close to the walls on each side is a single rail, the two forming a track very nearly the width of the building; on each runs a derrick having a capacity of 15 tons. This is necessary for handling the big guns and heavy forgings. Right here it may be said that no casting is being done at the foundry. The parts or forgings are brought from other places and simply made into a gun there. Jackets and bands of various weights and thickness lie about the shop, awaiting the day when they shall become part and parcel of one of those havoc-creating monsters.

Entering at the south end of the building, the engine-room is the first place of interest. It contains a 60 horse-power Buckeye engine, a hydraulic press with a capacity of about 200 tons, used for making gas-stops for the guns, and a powerful pump. Just beyond the engine-room on the same side of the building is the furnace, or, more properly speaking, the oven in which the bands and jackets are heated preparatory to being shrunk on the guns. On the right side of the building, just opposite the furnace, is the shrinking-pit, above which rise two derricks, one on each side. A few steps further on is the big room where the guns are bored and rifled. Two lathes and the big 15-ton derrick already described constitute about all the furniture of the place, but just at present there are two monster guns and a gigantic mortar there as ornaments. The

lathe which is now in use is 90 feet long and is capable of carrying anything that has been made at the shops thus far. Beyond the room containing the big guns is the shop in which light field-pieces are being made. Rows of benches line both sides of the shop and a corps of machinists are busy turning, filing and fitting portions of the breech mechanism. At the upper end of this shop stands one of the new guns on a light field-carriage, its narrow black muzzle pointing down the track that runs through the building. This gun needed only the introduction of a projectile and a cartridge to be ready for immediate use, so Colonel Whittemore took it as a model on which to give me my first lesson in gun-making. He got right down to first principles without delay.

BUILT-UP GUNS.

All the guns made at Watervliet are known as "built-up" guns, and are made by a series of bands or rings upon a steel tube. One of the field-pieces may be divided into seven parts for purposes of description, and this description will answer in all the essential details for one of the heavy guns, though the latter have many more bands, being re-enforced clear to the muzzle. Naturally the tube is part one, serving as it does as the foundation for the gun. Next comes the jacket, the broad heavy band shrunk on at the breech and extending about one-third the length of the gun. Next comes the trunnion band, which is shrunk on just forward of the breech, and which, in addition to serving as a strengthener, carries the trunnions which support the gun on the carriage. In front of the trunnion band is the sleeve, similar to the jacket but smaller, and forward of that is the collar and locking ring. The explanation for the arrangement of this series of bands is this: The recoil upon the discharge of the gun would have a tendency to force the gun back out of the jacket. Each succeeding ring shrunk on serves to bind the tube more firmly in its place, and the locking ring, the last one shrunk on, has an inside ring which sets into the surface of the tube, making everything secure. Preparatory to being placed upon the gun, the jacket is heated until just large enough to be slid into its place. No unnecessary heating is done, the object being to have a tight fit when hot. How tight it is when cold can better be imagined than described. The seventh part of the gun according to the above division is the base ring. This is back of the chamber and receives the breech-block when the piece is closed ready for firing.

After briefly explaining the different parts of the gun Colonel Whittemore proceeded to explain

THE BREECH ACTION.

The breech was open, affording a view clear through the bore. The breech-block, a cylindrical piece of steel with a small round hole extending through it longitudinally and with an interrupted or slotted screw cut on its circumference, was swung clear of the breech, exposing the chamber. In closing the breech the block was swung into place, the threads on its surface fitting the slots in the base-ring and *vice versa*. So finely was everything adjusted that the block swung into position with scarcely perceptible friction. The gun was not yet ready for firing, though. The block was not locked and a discharge, had one been possible under such conditions, would have blown the breech wide open. One-sixth of a turn of the handle in the breech-block to the right made everything fast, turning the block so that the screw-threads on its surface slid into those in the base-ring, making the whole breech practically one solid piece. Another part of the breech mechanism not yet explained is the gas-stop. This has a mushroom-shaped head that just fits the rear end of the chamber, and a plunger extending back through the hole in the breech-block already referred to. The mushroom head is of steel backed by an asbestos washer, which is in turn backed by a steel washer. When the charge is exploded the steel face of the mushroom head is forced back a trifle, squeezing the asbestos washer out at the edges until it completely fills the rear of the chamber, shutting off the escape of all gas through the breech. Another important piece of mechanism is the vent-stop. When the breech is opened after a discharge a thin strip of steel slides forward over the vent and remains there until the last movement is made in closing the breech. The object of this is to prevent the introduction of a friction primer before the proper time and so guard against any possibility of a premature discharge of the piece. The gun as it stood in the shop, field-carriage and all, weighed just a ton. The gun itself weighed 800 pounds and the carriage 1200. Its bore is $3\frac{2}{10}$ inches, and it fires a projectile weighing 14 pounds with a charge of $3\frac{3}{4}$ pounds of powder. A battery of these guns was sent down to New York at the time of the Washington centennial celebration, and was the admiration of artillerymen from all over the country. They are very easily handled and are effective up to a long range. The shops can turn out these small guns quite rapidly, at the rate of about 50 a year. The $3\frac{2}{10}$-inch size is the only one that they have been at work upon thus far, but they will soon commence the manufacture of $3\frac{8}{10}$-inch guns.

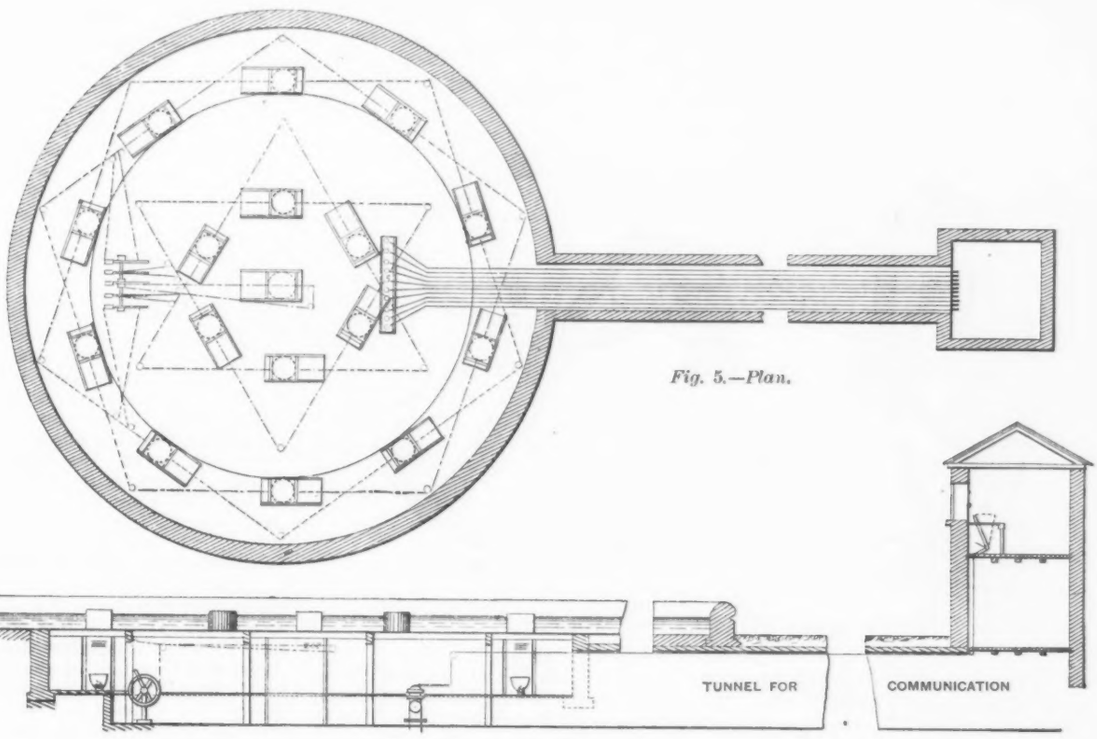


Fig. 5.—Plan.

Fig. 6.—Section.

THE ILLUMINATED FOUNTAINS AT THE PARIS EXPOSITION.

Leaving the light guns, Colonel Whittemore led the way back to the shop containing

THE BIG GUNS

in course of completion. The mammoth breech-loading mortar was first inspected. This is not in course of completion, but is undergoing repairs. It was sent in from South Boston to have a new breech-block put in. This grim-looking mass of iron weighs $14\frac{1}{2}$ tons, has a 12-inch rifle bore and can throw a 600-pound projectile six miles with a charge of 70 pounds of powder. The breech mechanism of this giant differs slightly from that of the field-piece The breech-block, a ponderous mass of steel, is hung on an immense brass hinge that extends under it and is called a consul. Two handles extend out from the back of the breech-block and a crank pro-

jects beyond the rear of the consul. The gas-stop and interrupted-screw system of locking is the same as in the small gun. To see the ponderous piece of mechanism as it hung there, one would think it a hard piece of work to close the breech. It was not, though. An easy pressure upon the block moved it easily and it swung smoothly and noiselessly up to the breech. As the big brass consul, which swung with the block, reached the breech, it was firmly latched in position by an automatic attachment. Two more movements were necessary to finish the closing process. First, the crank projecting from the consul came into play. This crank is attached to a double screw acting through the consul for moving the breech-block. A few turns of the crank sufficed to slide the block into the breech. Then a turn of a lever to the right finished the locking process and slipped the vent-stop from the vent. Everything was as finely adjusted and worked as smoothly as a piece of clock-work. These 12-inch mortars can be made for one-tenth the cost of one of the 12-inch long range guns, and the argument in their favor is that a battery of ten of them throwing shells a distance of six miles would be more effective than a single long-range gun under ordinary circumstances.

EIGHT-INCH RIFLE.

The new 8-inch rifle was next inspected. Only one man was at work upon it and he was using a small piece of oil-stone rubbing off infinitessimal irregularities on the surface. The breech mechanism had not yet been put in, so that the gun was nothing more than an immense steel tube. It is 23 feet 2½ inches long and has a range of from six to eight miles. With a charge of 125 pounds of powder it throws a 300-pound projectile with force sufficient to penetrate a 10-inch steel plate at 1000 yards. It was a beautiful specimen of offensive armor as it lay there. In finishing it a new attachment will be tried. Instead of having the breech mechanism built on the gun itself, a base-cap will be bolted to the breech for carrying it. The object of this is to save transporting the entire gun when a portion of the breech machinery gives out. Had the 12-inch mortar had a breech-cap, it might have remained at South Boston while the cap and its attachments came to Watervliet for repairs.

RIFLING.

A peep through the bore of the gun showed an interior like glass with a number of fine lines turning and twisting in a very puzzling manner. They showed the rifling of the bore. There are 48 grooves in the bore, each $\frac{1}{200}$ inch deep. The cutting was a very particular piece of work, as a single erratic movement of the cutter would have ruined the piece. After the gun had been bored it was adjusted on the lathe and elaborate preparations made for getting just the proper twist to the grooves. From the side of the lathe a long iron arrangement, looking something like a girder, stretched along the floor, one end coming almost up to the lathe and the other descending a short distance through the floor. This arrangement was longer than the gun itself, and as it sloped down from the lathe it curved. The curve to be made in the gun was what was known as a semi-cubic parabola, and the girder-like affair was a sort of guide. A long beam with a wheel at the lower end extended up into the air from the upper end of the guide. In its lower end was a wheel to run along the guide, and the beam itself was geared to the shaft of the cutting-machine. The result of all that queer gearing was this: As the cutter moved forward the wheel of the upright beam slid forward, the wheel of the upright beam slid down the guide, and the gearing by which it was attached to the cutter-shaft sent the cutter around inside of the bore as it went ahead. The amount taken off by the cutter at each trip was $\frac{1}{200}$ inch, necessitating ten trips to cut one groove, or 480 to complete the rifling of the gun. The 10-inch gun is now on the lathe being bored.

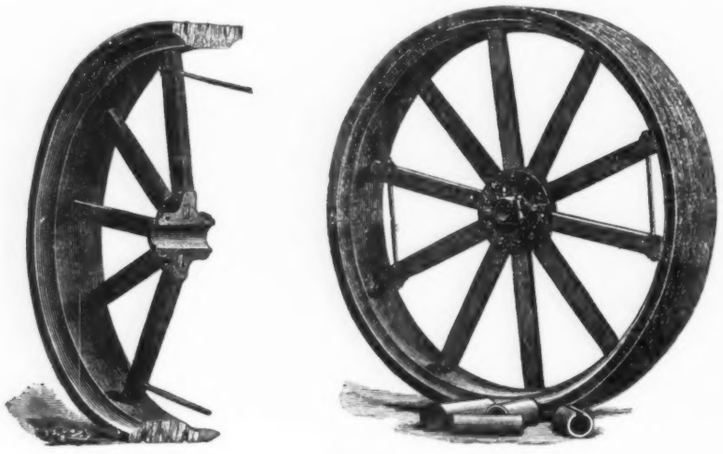
The semi-cubic parabola and its uses may be briefly described as follows: Near the chamber of the gun the grooves are nearly straight, but take on an increasing twist as they progress until within a short distance of the muzzle, when the twist becomes uniform. The object in starting the grooves so nearly straight is to avoid too great pressure at the start.

SHRINKING THE RINGS ON.

Returning to the room containing the furnace and shrinking-pit, Colonel Whittemore explained the uses of each. When a gun is ready to receive its jacket it is suspended in a vertical position in the pit. The jacket is placed upon a car in the oven and the fires lighted around the oven. When the workman in charge of the heating thinks that the proper degree has been reached the doors are opened and he makes a test. In testing he uses a stick with steel points, which are set at the required measurement. This stick is fastened crosswise to the end of a long pole. If the steel points on the end of the cross-stick will pass inside of the diameter of the jacket the proper degree has been reached; if not the heating must be continued. When the proper degree has been reached the car is run out, the jacket hoisted upon a derrick and swung over the gun. Then it is carefully lowered into position. Great care has to be taken to prevent excessive heating, as that causes the metal to scale; yet it is necessary to heat it enough or it cannot be fitted upon the gun.

THE NEW BUILDING.

Just west of the shop now in use an immense shop is in course of erection. It is to be 566 feet long by 125 feet and about 50 feet high to the eaves. Throughout nearly the entire length of the building a space 75 feet wide in the middle will be occupied by lathes running across. A railroad track connecting with the Delaware and Hudson road runs across the lower end of the building, passes down through the arsenal grounds, across Broadway and down to the arsenal dock on the river front. The advantages of having the gun-foundry accessible both by rail and water are obvious. It is expected that an addition to the new building will be built on the southern end.



The Keasey Iron-Center Wood Split Pulley.

Iron-Center Wood Split Pulley.

The Keasey Pulley Company, of Mishawaka, Ind., have been consolidated with the Great Western Pin Company, of Toledo, Ohio, who now manufacture the pulley of which we herewith present illustrations. In the Keasey pulley the hub, being of cast-iron, can be clamped rigidly to the shaft. In addition to this it is supplied with two set-screws, or is made with a key-way when desired. As the hub is clamped tightly to the shaft there is no danger of the set-screws throwing the pulley out of balance. The hub is made with recesses, into which the spokes are driven and a disk or bore flange is bolted to it, the bolts passing through the spokes in the same way as in a patent wagon-wheel. The rim is made of yellow poplar and is built up to one-half the intended width; the center is laid on the half-finished rim and the spokes are let into it. The balance of the rim is then completed, sawed in two, rebolted together and turned. The bushings are made of paper, those $\frac{3}{16}$ inch and under being entirely of paper, while above that size they are backed out with wood. Loose pulleys are furnished with sleeves of vulcanized fiber 2 inches longer than the face of the pulley, and which, it is claimed, will outlast an iron sleeve. It is claimed that this pulley will not warp, and that as only the edges of the spokes are presented to the air during rotation but little resistance is offered, and only a small amount of power is lost as compared with pulleys so made that their spokes act as fans.

The Illinois Elevated Railway Company last week filed articles of incorporation in the office of the Secretary of State at Springfield. The capital stock is placed at $10,000,000, and the incorporators are Michael W. Ryan, John Tyler, Edward C. Donnelan, William H. Bell and Paul Brown, all of Chicago. Michael W. Ryan was seen by a reporter and said: "I am not yet at liberty to give the names of the men back of this company, but will say that they are all Eastern men and have ample means. They have been here looking into the matter five or six months and have determined to build a system of elevated roads on the West Side. They have seen that it is needed here and that everything is about going to sleep over here for lack of just such an enterprise. These men will not float a dollar's worth of bonds, but will pay cash and build it themselves. Of course this is on the condition that rights of way can be obtained, of which there is little or no doubt. These secured, work will begin immediately. It is not a speculative move, nor is it in the remotest degree connected with any similar scheme contemplated here."

Louisville Pumping Engines.

With Supplementary Sheet of Engravings.

The engine of which we herewith present drawings of the principal parts was designed by E. D. Leavitt, of Cambridgeport, Mass., and Charles Hermany, of Louisville, Ky., and is now being built by the I. P. Morris Company, of Philadelphia, for the Louisville Water Company.

The engine is of the balanced "inverted beam" type, which is now used by Mr. Leavitt in all his designs of pumping-engines, as well as in a number of his large mining-engines. Both cylinders are vertical and inverted, the high-pressure working on one end of the beam and the low-pressure on the other end. The pump plungers have a shorter stroke than the steam pistons, being worked from nearer the beam center than the point of application of the steam links. The fly-wheel shaft is centered to one side of the main part of the engine, and is worked by a connecting rod from the upper part of the beam. It will be noticed that the whole arrangement is such that all parts of the engine are almost perfectly balanced in all positions, and at the same time friction is reduced to a minimum, both by this balancing and by substituting pin friction for slide friction wherever possible. The engine is designed for a duty of 16,000,000 U. S. gallons for 24 hours, the maximum head being about 185 feet. The steam pressure to be used is 140 pounds per square inch. The speed of engine at regular working capacity will be 18 revolutions per minute.

The high-pressure cylinder is 27 inches in diameter and the low-pressure 54 inches, each having a piston stroke of 10 feet. Both cylinders are jacketed on the plan covered by Mr. Leavitt's patents. It will be seen in Fig. 4 that each cylinder and its jacket is cast in one piece. The jacket is not continuous, however, but has an opening about 3 inches wide all around it at about the middle of the length. This opening is covered by a copper expansion ring which is bolted tightly to both parts of the jacket. This method of jacketing has the advantage over the method of using a separate-working lining inserted into the cylinder jacket that in the latter case the clearance at ends of cylinders and in steam passages is not increased above that which would exist in an unjacketed cylinder. At the same time the difference of expansion of the inner and outer walls is perfectly provided for, and the expansion arrangement is on the outside of the cylinder, where any breakage can be easily detected and remedied.

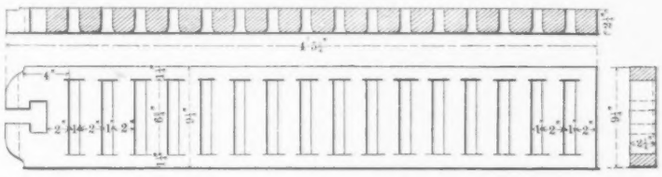


Fig. 6.—Low-Pressure Inlet-Valve.

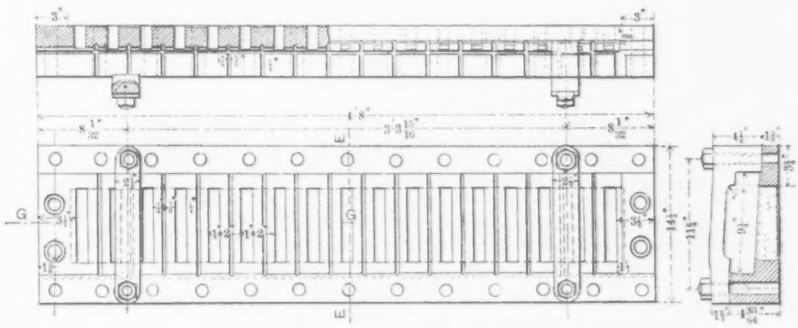


Fig. 7.—Low-Pressure Inlet-Valve Seat.

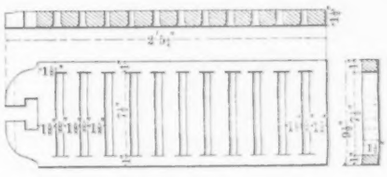


Fig. 8.—High-Pressure Inlet-Valve.

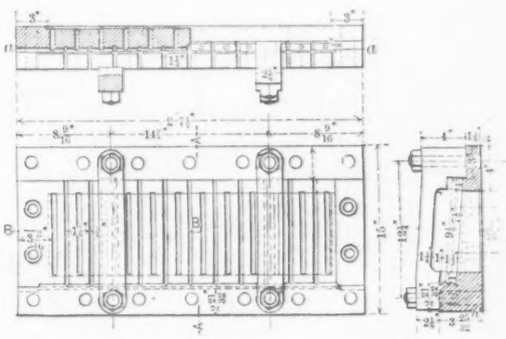


Fig. 9.—High-Pressure Inlet-Valve Seat.

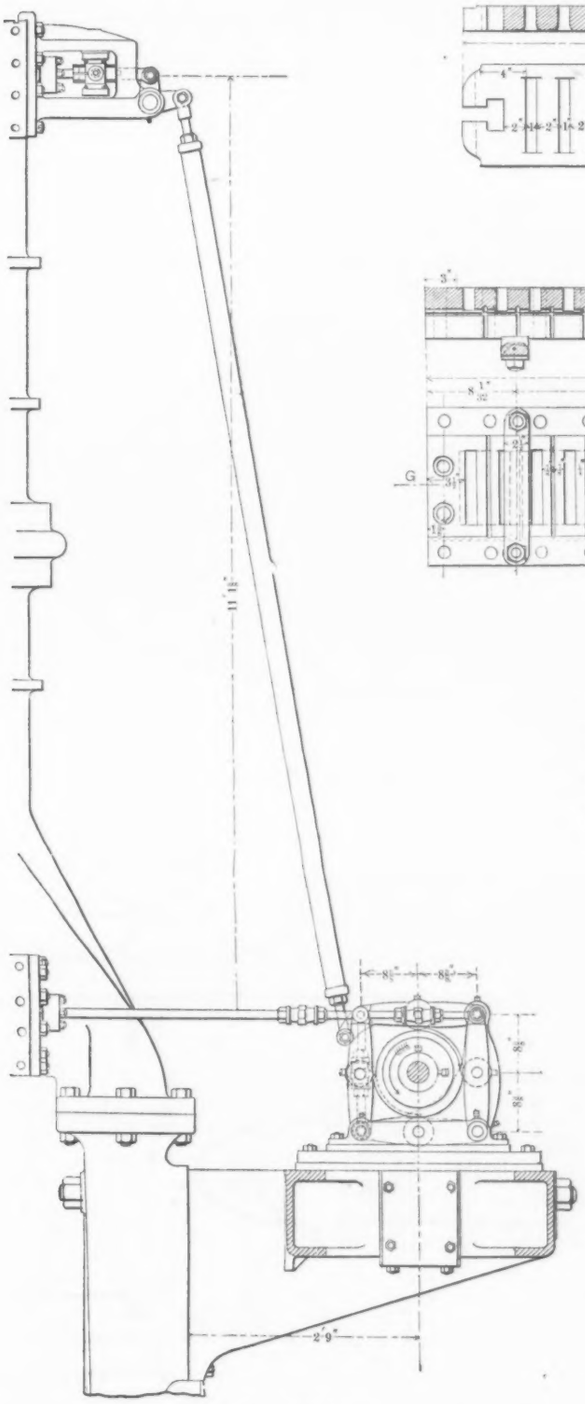


Fig. 10.—Valve-Gear.

There are separate gridiron steam (Figs. 6 to 9 inclusive) and exhaust valves for each end of each cylinder, worked by cams. The high-pressure valve-gear is shown in Fig. 10. These cams are placed on shafts which derive their motion by gearing from the crank-shaft. The low-pressure cut-off is fixed, and the high-pressure regulated by a centrifugal governor. In the Leavitt cut-off the valves always have the same travel, no matter how much the point of cutting off may be changed. The steam valve is opened by one cam and closed by another, the point of cut-off being determined by the position of the cut-off cam on its shaft, this position being regulated by the governor. The cut-off being a positive one is applicable to engines of any speed as well as to slow-speed engines like the one here described. The arrangement of the valves is such as to give a very small clearance, amounting to only about 1.6 per cent. of the piston displacement. The effect of the constant length of valve travel is to make the wear very even and to make the valves keep tight. Valves designed by Mr. Leavitt on this principle were recently examined after 16 years' constant use and found as tight as when first fitted.

The exhaust from the high-pressure cylinder on its way to the low-pressure valve-chests passes through reheaters which contain an aggregate of 2900 copper tubes $\frac{5}{8}$ inch outside diameter and 2 feet 6 inches long between tube sheets. Live steam from the boilers passes through the tubes and the water of condensation is led directly back to the boilers, the same as water drained from the jackets.

The connecting rod, forged of open-hearth steel, is 14 feet long between centers. The boxes are Eureka steel castings with babbitted wearing-surfaces. Both rods are fitted with adjusting bolts and wedges. The boxes are bored at beam end 9 inches diameter and 15 inches long, and at crank end 13½ inches diameter and 15½ inches long. The crank-shaft is built up with a double throw-crank of 3 feet 6 inches

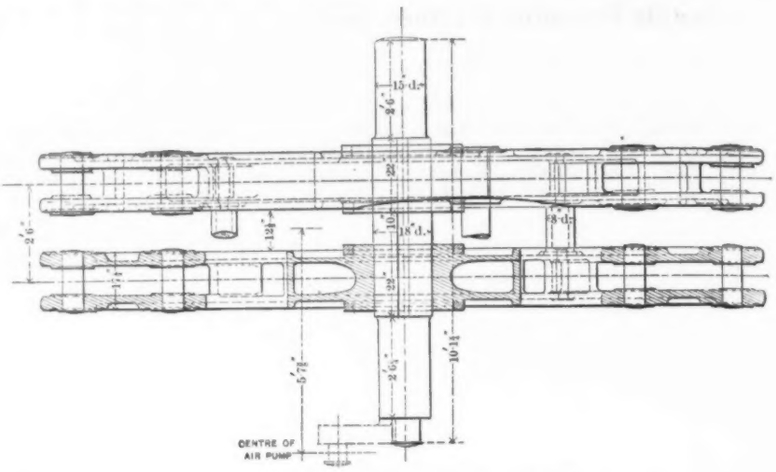


Fig. 11.—*Beam.—Sectional Plan at Center Line A A.*

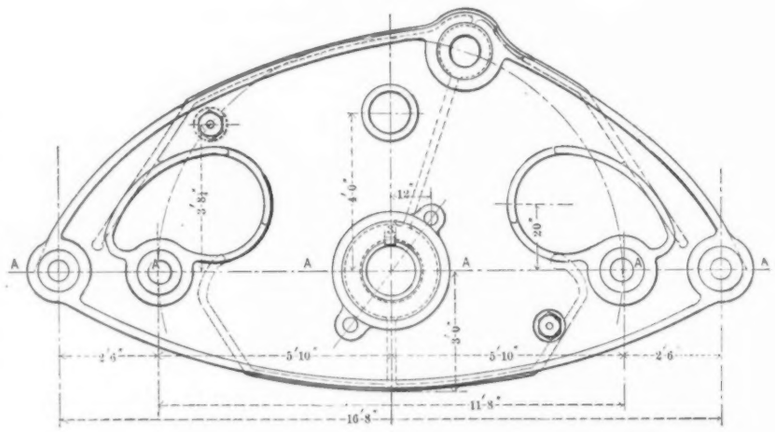


Fig. 12.—*Beam.—Side.*

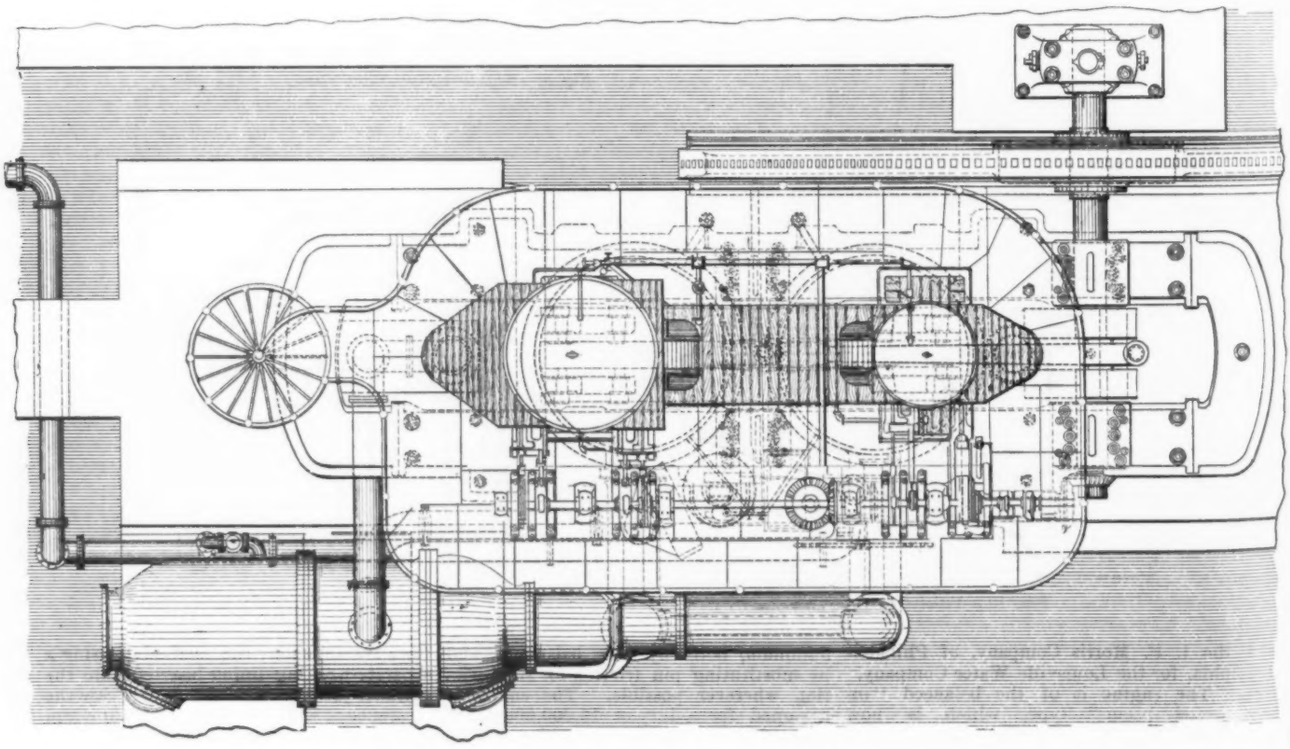


Fig. 3.—*Plan.*

radius. The shaft and crank-pin are of open-hearth steel and the cranks forged of best selected scrap-iron. The crank-pin has a 4-inch hole drilled longitudinally through its center, and the shaft has similar 5-inch holes. The shaft has three journals, one on each side of the crank and one beyond the fly-wheel; all 17 inches diameter. The main journals are 33 inches and the outboard journal 32 inches long. These journals work in four-box pedestals with babbitted bearing-surfaces.

The boxes are adjustable in all directions, and those of the outboard bearing are self-adjusting by means of swivel-blocks.

The beam (Figs. 11 and 12) is made of two massive hollow gun-iron castings, with steel pins forced in for the various connections. The beam center-pin has two bearings, 15 inches diameter and 30 inches long. The beam pedestals are similar to those for the crank-shaft. The fly-wheel is made of cast-iron in 12 segments. It is 36 feet in diameter and 15 inches wide on the face and weighs about 57 tons. The two main pumps (Fig. 13) are exactly alike in all respects and are of the differential plunger type. The plungers are of cast-iron, turned to a diameter of 24 1/16 inches for the upper and 34 inches for the lower plungers. Both plungers have a stroke of 7 feet. Each plunger and of the same stroke as the air-pump for forcing air into the air-vessels of the main pumps.

There are three boilers (one being spare) of the Belpain fire-box, horizontal tubular type, each having 52½ square feet of grate surface and 2241 square feet of heating surface, making a ratio of 42.7 to 1. Each boiler has two furnaces opening into a combustion chamber common to the two. There are 159 tubes in each boiler, 3 inches outside diameter and 16 feet long between tube sheets. The boilers are built of the best open-hearth steel that can be procured. The ash-pits, smoke-boxes, &c., are of cast-iron, so that each boiler is self-contained, and no brick-setting is required.

An overhead traveling-crane of 35 tons capacity is provided for erecting the engines and for subsequent use in overhauling and making repairs. A crane of this sort worked by hand power is always provided for by Mr. Leavitt for his large engines. The crane about pays for itself in the erecting of the machinery, and is then on hand to save time and labor in work which may afterward be found necessary.

The drawings from which these large pumps are being built form 78 large sheets, while the specifications fill a volume of 150 printed pages.

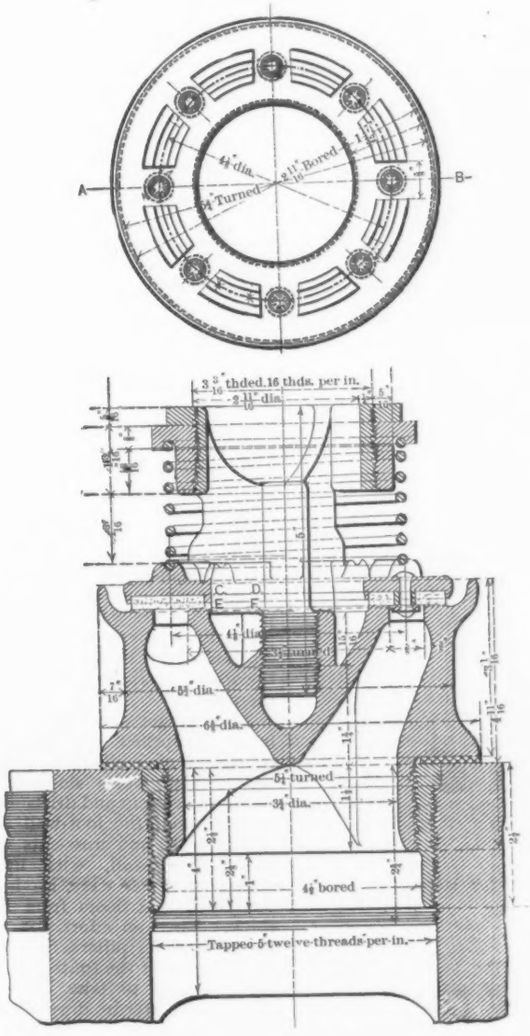


Fig. 14.—Pump-Valve.

pump has 143 suction-valves and 124 delivery-valves. The valves (Fig. 14) are of composition working under bronze springs. They are of annular shape, 5½ inches external and 2⅞ inches internal diameter, arranged for a lift of 5/16 inch. The valve-seats are of composition and are screwed into composition bushings, which in turn are screwed into the cast-iron valve-plates.

There is a surface condenser having 1306 brass tubes 1¼ inches outside diameter and 5 feet 6¼ inches long. The water discharged from the main pumps passes through the tubes, and the exhaust steam around the outside. The air-pump is vertical double-acting, 30 inches diameter, with a plunger stroke of 24.6 inches. The pump is worked by an arm on the beam center-pin. There is a pump of 4 inches diameter of

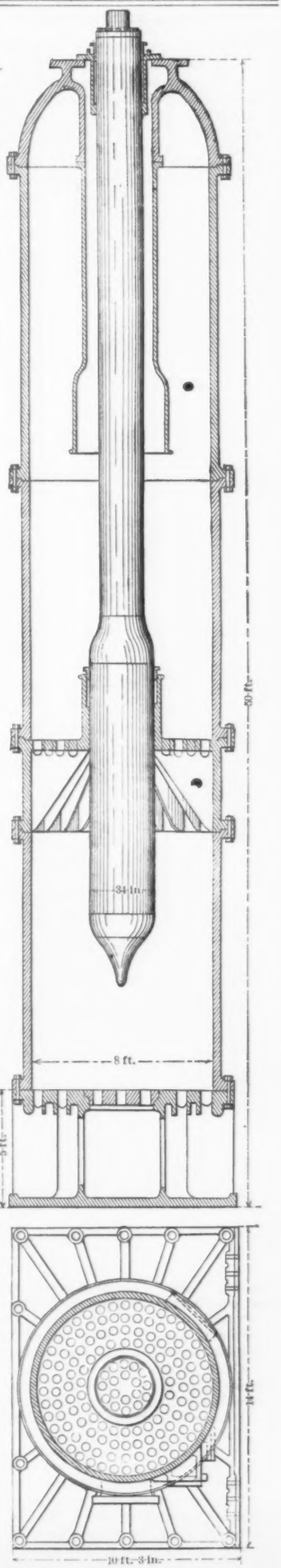
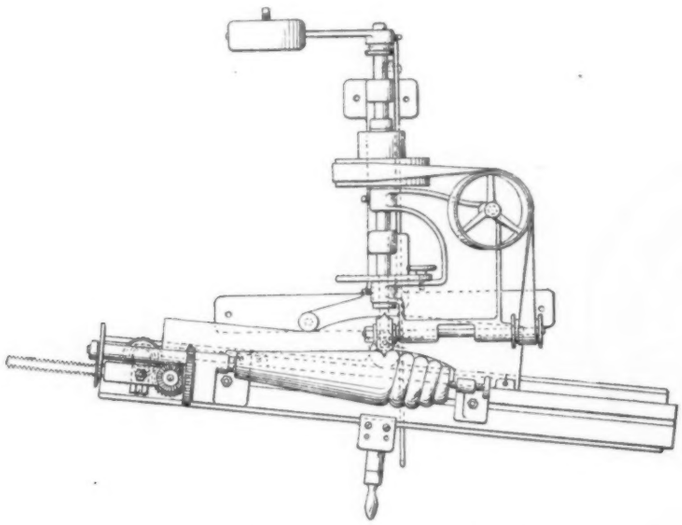


Fig. 13.—Sec. Elevation and Plan of Pump.

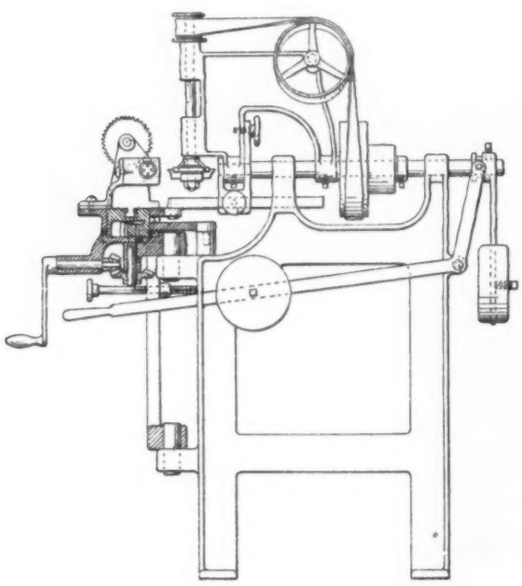
England has received from the Sultan of Zanzibar a concession of 600 additional miles of coast which will be opened to trade.

Lathe for Turning Spiral Forms.

As commonly made, lathes for turning spirals comprise a bed provided with centers for carrying a piece of work, a guideway for the bed, gearing for traversing the bed along the guideway and a spindle provided with a cutter-head and supported so that the cutter-head may be adjusted to cut in a plane of greater or less obliquity to the axial center of the work, so as to provide for cutting spirals of any desired degree of pitch. The drawings



Plan View, with Cutter and Frame to Extreme Right.



Vertical Section.

LATHE FOR TURNING SPIRAL FORMS.

here presented show the general arrangement of a lathe for turning spirals built by P. Pryibil, of New York City. The movable frame has a guideway in which a work-table, provided with head and tail stocks which center the work, is moved lengthwise by gearing operated by hand. The frame is mounted upon vertical pivots, so that it may be swung in a horizontal plane. In order to present the work properly to the action of the cutter-head the head-stock spindle is rotated, as the bed is moved lengthwise, to turn the work. This is accomplished by the bed itself through suitable gearing. The bed always moves along the frame at a uniform speed, the variation in the pitch or twist of the work being produced by changing the gear through which rotary motion is imparted to the spindle. The cutter-spindle is mounted in a frame supported by a fulcrum bar, which is free to turn and to slide in bearings on the main frame. The drawings show the method of driving the cutter. The weighted bell-crank lever, shown in the lower view, always tends to move the spindle-frame toward the work, except when engaged with its locking-notch. The depth to which the cutter enters the work is controlled by a former secured to the traveling table, and which regulates the distance of the tool from the axis of the work. The tool has been found well adapted for turning spiral forms of varying diameters.

The autumn meeting of the Iron and Steel Institute will be held in Paris from the 24th to the 26th of September, both inclusive. On Thursday, the 24th, there will be a reception by M. Haton de la Goupilliére, president of the Société d' Encouragement pour l' Industrie Nationale, and M. Gustav Eiffel, president of the Société des Ingénieurs Civils, followed by the reading of papers and a visit to the exposition. Wednesday will be spent in a similar manner, the evening being reserved for the annual dinner of the institute, to be held at the Hotel Continental. Thursday morning the institute is invited to ascend the Eiffel Tower and to luncheon on the first platform. In the evening the party leaves on excursions to Creusot, St. Chamonds Firminy, Unieux, St. Etienne, and other works in the Loire, Luxembourg and the Nord.

The Reopening of the Tilly Foster Iron Mine.*

BY F. H. M'DOWELL, NEW YORK.

During the last 18 months the Tilly Foster Iron Mine Company, the president of which is Mr. E. F. Hatfield and the managing director Mr. B. G. Clarke, have been carrying out a plan for the reopening of their iron mine at Tilly Foster, Putnam County, N. Y., which for boldness of design and promptness of execution stands unrivaled. The credit for bringing the operation to its present stage of success belongs to Mr. E. S. Moffat, general manager, who has had charge of the whole operation, and Mr. Clinton Stephens, of the firm of Stephens & Arnold, contractors. The writer has been connected with the work as engineer.

The Tilly Foster Mine, before its purchase by the present owners, was worked in a desultory way whenever the price of ore reached the point of a small profit over the high rates of freight and cost of mining. Under the present management a larger and more regular output was maintained until the old system of mining could no longer be pursued. The old system consisted in sinking on the ore-body from the surface to the 165-foot level, and leaving ore-pillars to support the hanging-wall, the vein being over 100 feet wide at this level and the overhang, in places, nearly 50 feet. When these pillars proved inadequate and caves occurred, both ore and rock were removed from the pit and the ore was assorted on the bank, precautions being taken to prevent, by the erection of dry masonry and cement walls, the spread of these caves at the ends of the pit.

After the pit was exhausted new workings were opened below the 165-foot level by means of inclines sunk on the foot-wall, which has a slope of about 60°. Stations were cut and drifts were run right and left along the foot-wall at every 100 feet in depth and cross-cuts were made to the hanging-wall, with upraisers into chambers 20 feet wide, leaving pillars 20 feet thick and floors from 15 to 25 feet thick. Then an effort was made to rob the mine of its pillars, first by springing brick arches at the south end from foot to hanging wall to take the place of the pillars, and later by drawing the ore from the chambers after caves had been developed in both floors and pillars. These efforts failed, as did in turn every other scheme devised for the extraction of the reserves. The situation called for heroic measures, and the plan finally adopted necessitated the handling of over 500,000 tons of rock, with the expenditure of more than $250,000. The scheme adopted necessarily involved stripping to the 165-foot level at all points. In some parts of the mine, where the greatest width of ore-body occurs, the stripping must go even deeper. The new hanging-wall slope varies from a vertical position to an inclination of 1 foot horizontal in 6 feet vertical.

Up to the present time no difficulty has been experienced in securing good, strong, natural walls, and the work of stripping is so far advanced that Messrs. Stephens & Arnold have entered into a contract to de-

*Read at the New York Meeting of the American Institute of Mining Engineers.

liver a minimum of 50,000 tons of shipping ore during 1889. The methods devised by Mr. Stephens for the rapid removal of rock and ore are worthy of consideration. At the narrow ends of the ore-body steam-derricks are in use, and across the intervening space of about 300 feet four cables have been stretched. Two of these are horizontal cables, 2 inches in diameter, supported at each end by well-braced towers and strongly anchored into the rocks. On each cable a trolley is moved back and forth by a traversing rope, passing around one drum of the engine, while another drum of equal diameter carries the fall-rope which hoists the rock and ore out of the pit. As the engines are combined link motion and friction, the engineer can move his load horizontally or vertically at will. The other two cables are inclined, one end being anchored in the foot-wall about 100 feet from the surface, and the other, after passing over a tower, on the bank. In this system the movement of the trolley in its descent is regulated by a stop-block, the location of which on the cable is controlled through a tail-rope by the engineer, one drum being made to raise the load vertically out of the pit and along the incline table to the surface.

To save time and handling, the car bodies are lifted from the trucks, lowered into the pit and exchanged for loaded ones, which are hoisted to the surface, lowered upon the trucks and run out to the dumps by horses. In this way 1000 tons of material have been handled every ten hours. To expedite the work of loading the car bodies, light auxiliary cables are used by means of which pieces of rock too large for the men to lift are readily hoisted into the bodies, while the main cables are kept busily employed in removing those already loaded. The ore has, in the past, been cobbed and assorted by hand on the bank. A large Brennan crusher has lately been erected, and hereafter the sorting will be done in the pit and the ore will be reduced to furnace size on the bank. The taking of monthly measurements upon which to base estimates for contractors has been no small task, especially as there are two classes of materials to be blasted and hoisted from each of the four levels, besides a special class, making nine classes in all, with their corresponding prices.

Fifty cross-section sheets, made up from careful preliminary surveys, upon which the elevators, taken every 10 feet across the pit, have been plotted, afford a means of keeping accurate records of the progress of the work. The planimeter has been used to good purpose at the end of each month to get up prompt returns for the contractors, and these have been checked, in turn, by prism-measurements, which are final and conclusive. At the writer's request Mr. C. C. Mattes, the mining engineer of the company, has been associated with him in his work, and has lately developed a very comprehensive system of measuring the pit by means of a trolley traveling upon a light, suspended, movable cable, the leveler remaining with his instrument on the bank. This will prove invaluable as depth increases and is worthy of a special paper. The shipping ore is now mined by the contractors for from 85 cents to $1 per ton, the lean ore being delivered to the dump at rock prices, which are from $1.15 to $1.45 per cubic yard, according to the level hoisted from.

The undertaking has been based upon the expected recovery of 600,000 tons of shipping ore, against which a royalty of $1 per ton is charged to cover the stripping and incidental expenses. Earnest efforts are now being made to utilize the lean ore, which has heretofore been a waste product, and to increase the ultimate output of ore by judicious mining, in the hope of reducing the cost of stripping to 50 or 60 cents per ton on the aggregate of ore thus made available. The following statement gives a comprehensive view of the progress of the work. The rock is gneiss and the ore magnetite:

Number of Cubic Yards Removed.

1887:		August.....	14,858.41
June.....	600.00	September..	13,850.75
July	3,682.00	October	12,896.66
August.....	4,817.13	November..	12,669.97
September..	7,684.68	December..	12,024.95
October	8,785.00	1889:	
November..	10,512.47	January...	11,939.07
December...	11,428.12	February...	10,309.18
1888:		March.....	12,149.44
January....	9,983.40	April.....	7,406.87
February...	10,088.24		
March.....	9,312.16	Total....	234,570.39
April.....	10,707.18	Stripping ore.....	7,211.66
May.....	13,221.78		
June.....	13,443.95	Rock.....	227,358.73
July.....	12,198.98		

The ore removed during the progress of the stripping has amounted to 7211.66, leaving 227,358.73 cubic yards of rock. This amount of rock includes several thousand tons of lean ore accumulated on the dump, in addition to about 100,000 of such ore mined before the stripping began. The whole quantity is now awaiting the results of experiments in progress to determine the details of subsequent treatment. At the present time the material hoisted is almost wholly first-class and lean ore.

A System of Marking Patterns.

At the April meeting of the Engineers' Club of St. Louis A. J. Frith presented the following paper, which we take from the Journal of the Association of Engineering Societies:

The following system of marking has been found so useful that while it may not be especially novel, it is believed that it will be of interest to many. We are all aware of the great confusion that arises in the care of patterns, the difficulty of keeping the small parts of various machines to themselves, the perplexity in gathering every essential core-box, &c., when old patterns are to be used, and the dependence on the special knowledge of one man when any particular casting is desired. The desirable points in a system of marking patterns to lessen this annoyance were considered to be:

1. That there should be as little clerical labor as possible.

2. That a special familiarity with the machine should not be a requisite when casting is desired.

3. That one could feel assured when patterns go to or are returned from the foundry that no loose pieces nor core-boxes are missing, and do this without consulting unhandy records.

4. When patterns or parts of patterns become mixed together, which seems unavoidable, that any piece, no matter how insignificant, can be at once distinguished and sorted out by any careful employee.

To insure complete control over our patterns it is first necessary that they should be marked and a list taken. This system was begun in the drafting-room, where the drawing of each casting was given and marked with a consecutive number, all parts of one machine having a characteristic symbol. Then in a small book these were recorded as follows:

13-Inch Slotter.—Symbol S.

Consecutive number.	Sketch.	Name.	No. of pattern.	No. of loose pieces.	No. of core-boxes.
1.....	Roughly made sketches of each pattern.	Frame.....	1	3	2
2.....		Ram.....	1	5	2
3.....		Slide for ram..	1	3	2
4 ...		Gibs for ram.....	2	..	..
5.....		Quick return..	1	1	1

This record is kept in pencil to allow changes up to date to be easily made. The first column contains the consecutive number of each pattern. The second column a roughly-made sketch of each pattern, which greatly facilitates the finding of a piece needed, as the description in the third column is necessarily brief. The fourth, fifth and sixth columns give the number of patterns to each part, the number of loose pieces, and the number of core-boxes. This may look a little complicated, but it only needs a little attention once, and our clerical labor is finished. Thereafter, when the pattern or any part is needed, whether it is known by number, by name, or only by general appearance, this list furnishes complete data for identification of all its parts. Upon each pattern, before it is varnished, is stenciled a legend, thus, for the "Slide of the Ram:"

S No. 3.
3 pieces A, B, C.
2 Core-boxes, Z, X.

Being varnished, this record is indelible and always present. Metal numbers, S. 3, are added, that the symbol may appear on the casting. The corresponding loose piece is stenciled S. 3, Piece A, or the Core-box S. 3, Core-box X, &c., and so for all the other patterns, pieces, &c. Hence wherever the pattern is the record of all its corresponding parts is at hand for reference, and is intelligible to any one, or any piece, no matter how trivial, has an indelible mark that enables us to place it at once. It has been suggested that by not marking pieces and core-boxes by letters, a, b, c, &c., the legend would be rendered much simpler, the legend above becoming merely

S. No. 3.
3 pieces, 2 Core-boxes,

each piece and box being simply stenciled S. 3, showing thereby that it belongs to pattern No. 3 of machine S.—that is, the 13-inch slotter. This, however, requires the counting of the number of pieces, &c., and the identification is less certain, while if any core-box is to be used for more than one pattern the necessary instructions become somewhat uncertain.

It has become necessary also to stencil the word "Face," not on all the planed surfaces, but on those that particularly need to be clean, that the foundry may be reminded where to be more careful. Naturally, the use of the 2 S., 3 S., &c., for other sizes of slotter, or L., 2 L., &c., for different build of lathe, &c., will occur to the user. It is believed that a little attention given to some such system as this, especially for standard machines, gives a record of easy reference and a means of bringing order out of the chaos common in too many pattern lofts.

ECONOMY IN THE PATTERN.

In regard to the economy of manufacture, as viewed in the pattern, there are so many facts and circumstances entering the problem that I shall touch upon but a few instances that point the direction in which to turn our attention. The economy in the pattern itself—that is, its cost in labor and material; this economy should be governed by the number of castings we expect to obtain from it, it being evident that the thought and labor justified and economical in the production of a number of machines would be extravagance where but a few castings are to be produced. In the latter case the original cost of the pattern is a sensible percentage of the total value of the product, and to reduce this as much as possible we should confine our designs to straight lines and flat surfaces, curves and warped bodies being expensive in both time and labor. The pattern can be roughly made, with little provision for warping, as few ribs and fillets as

possible are desirable, with few and plain cores, it being generally economy to sacrifice appearance, to be lavish in metal and ignore many points, though not those of efficiency and stiffness in the final machine. When the pattern, however, is expected to be duplicated many times, true economy of construction calls for much thought and care, and frequently very elaborate and costly patterns are the cheapest in the end. It pays to build up rings and gear-wheels of many parts that time may not warp them nor rough usage so dislocate faces and parts that the resulting castings are scanty in metal in one part or require excessive finish in another. We should now consider closely how the casting is to be handled, both in finishing and in erecting, cutting down turned and planed surfaces to the smallest allowable limits, and not be afraid of using small and numerous cores where your judgment bids you. Excessive amounts of finish on bright surfaces can frequently be curtailed, and in other cases where cored round holes are horizontal, and the core therefore liable to shift or rise in the molten metal, we may properly add an extra amount of metal, that the requisite size may be assured, despite accidents.

It is frequently advisable where cored holes are in line one with the other to use one long core passing through both bearings rather than two smaller ones, as we are thus assured that the holes in the resulting castings will be in line, thus saving the cost of careful setting of the piece and the long and difficult boring that would be necessary to obtain the required dimensions. In other cases, such as in long holes, where it is not necessary that the running shaft should bear the entire length, it is customary to enlarge our core between the bearings, so that we may only be at the expense of finishing the bearings and not the entire distance; but judgment must be displayed in the use of such devices, for if, as in this instance, the thickness of metal at our command does not allow us to make this recess a very decided one and the core should shift somewhat in the casting, there is no economy, for we may be chagrined to find that a large part of our boring is just in the rough surface of the recess, and the expense in obtaining a true hole is perhaps more than doubled. If I had the space I could cite many similar instances, emphasizing the necessity of care in the use of our little schemes for economy and of the study of the various operations, methods of handling and final erection through which the casting is to pass, where the cost of the finished product is dependent on the pattern, but I will merely touch on a point in which much uncertainty is frequently displayed.

Castings are frequently made very thin and light, with a view to save the cost of the unnecessary metal, which is good economy; but it is not considered that the thinner we make our casting the more difficult it is to prevent it from being badly sprung in cooling, in which case we will have saved a few pounds of cheap iron and necessitated several days of costly machine work to finish it. In all this I do not mean to decry the effort to save metal by making our castings light, but only to impress the necessity of considering well the effect of each effort to do so.

We have heard that to avoid this trouble of warped castings it is better to have all parts of a uniform thickness, with heavy fillets between ribs and surfaces; but this rule is not one of rigid application, though that of its true meaning, uniform cooling, is true, as far as my experience extends. For instance, if we have to cast a flat surface, stiffened by deep ribbing, we will find that if the surface is to be planed it will be cast face down, that the planed surface may be freed from floating dirt; this brings the ribs uppermost, and if to economize metal the ribs be made lighter than the face, they will cool first, and if the resulting casting be of any length, it may be bowed $\frac{1}{4}$ inch, requiring much extra time to true up the face. Even if the ribs be made of the same thickness as the face, they will still cool first and bow the casting, since they are nearer the surface and removed from the greater body of hot metal. In cases similar to this we have obtained the most economical results by cutting down the thickness of the face or body of the casting and making the ribs considerably the thicker that they may be retarded in solidifying until the metal deeper in sand has begun to stiffen, while $\frac{1}{8}$ inch saved over the larger face amounted to more than $\frac{3}{8}$ inch taken from the ribs. We believe that the same idea can be frequently applied with marked economy in metal and labor. These instances are to show that, when viewing the economy of manufacture in the pattern, the best economy is obtained by keeping well in mind the subsequent manipulations and probable errors in the foundry, that while we make use of careful coring, recessing of core-holes and light castings and ribs, we may not enhance the final cost by unwise economy.

One word more I would like to add, as to the necessity of accuracy and frequent checking of measurements, as there is nothing more frequent nor more exasperating than errors in the dimensions of patterns. It is not enough to carefully check the sizes on the drawing, but the pattern should be viewed during construction, in imagination, as fitting in the finished machine, thus guiding us to detect possible interferences, and often to discover that our patterns, while correct in dimensions, are actually reversed or upside down; and whenever possible, all patterns of parts fitting one into another should be kept back from the foundry until all are finished, so that they can be placed together as they belong and the dimensions checked independently of the design. Only by unremitting care can we thus, in complicated machinery, obviate the occurrence of annoying errors.

Opposed to Restricting Commerce.

F. A. Flower, of West Superior, was elected chairman of the railway convention which met at Sault Ste. Marie, Mich., on the 28th ult. The convention was called to draw up a memorial to Congress against legislation interfering with free interchange of traffic between Canadian and American railways. Delegates were present from Minnesota, Dakota, Wisconsin, Michigan, Illinois, Pennsylvania and Iowa. C. H. Chadbourn was temporary chairman. The Committee on Resolutions comprised H. W. Seymour, ex-Congressman, of Michigan; A. C. Raymond, of Detroit; Dr. David Day, of St. Paul, and H. G. O. Morrison and J. H. Bradish, of Minneapolis. The memorial to Congress reported by the committee and which was adopted is as follows:

Whereas, Attempts have been made to procure by Congressional enactments and treasury regulations restrictions upon the international transportation facilities at present afforded the American consumer and producer; and

Whereas, The interests of the East, West and Northwest would be seriously affected by such restriction, and the food-producing districts of the northwestern portions of the Union necessarily and unjustly burdened by unfriendly legislation upon international traffic; and

Whereas, The bonded and transit system has been confirmed by treaty of mutual interests, and international comity demands that if any regulations are deemed necessary by any considerable portion of the people they should be formulated and adjusted in like manner and not otherwise:

Resolved, That we hereby affirm our adherence to the principle of an unrestricted international railway transportation and demand of our Congressional representatives that no change shall be made or restriction imposed except by the conference and consent of the people of the two countries interested.

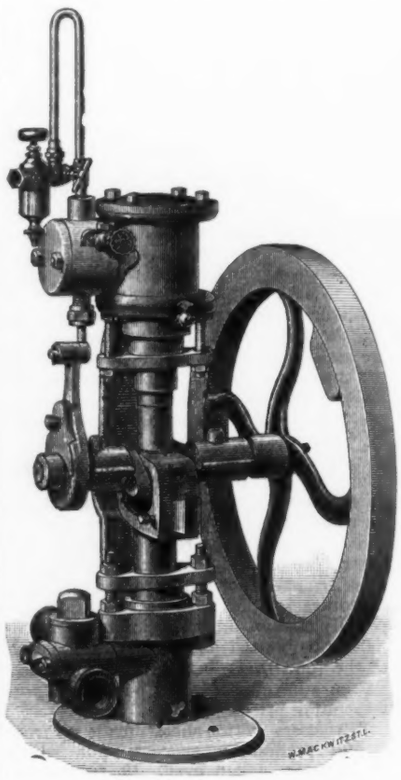
Resolved, That a free and cheap system of international transportation is a fundamental and necessary principle of public and individual prosperity.

Resolved, That we request our Senators and Representatives in Congress to oppose any legislation restricting present international transportaiion facilities as injurious to the interests of the people and burdensome to the producer and consumer.

Papers were read by A. C. Raymond, of Detroit, and H. W. Seymour on the subject.

The Reliable Steam-Pump.

We herewith illustrate a steam-pump intended for feeding steam-boilers with either hot or cold water. This pump has



The Reliable Steam-Pump.

been on the market for several years and has gained a reputation for reliability and economy. The crank is so constructed that the pump will start at the center, thereby enabling it to run very slowly or at a high speed without subjecting it to undue strain or jar. It will take water from any heater and is claimed to use one-tenth less steam than any inspirator or injector. The pump is made by Ripley & Bronson, of St. Louis, Mo., in six sizes, from 5 to 100 horse-power, the two smallest sizes being made with a bracket to bolt on portable boilers when wanted. The Swift Sight-Feed Lubricator, shown in the cut, is furnished with the pump.

A large area of asphalt, 13 feet thick, has been discovered near Cloverport, Ky. It is almost identical with the asphalt discovered in California, which is claimed to be superior to Trinidad for street purposes

In all there have been 14 sealers boarded by the Rush and warned out of Behring Sea, besides six captured. A steamer at San Francisco brought down 100,000 sealskins for the Alaska Commercial Company.

Two-Spindle Drill.

This drill, which is manufactured by Woodward & Rogers, of Hartford, Conn., is intended for light work up to ½-inch holes. The spindles are counterbalanced by weights and are adjustable by moving the arms, which are gibbed to the front of the uprights. They have a traverse of 13 inches, have taper holes and their throw by the feed-lever is 3⅜ inches. The distance from the center of the spindles to the column is 6 inches. The table is 19 x 11 inches and moves the entire length of the column, giving a distance of 46 inches between the table and the spindles. There is no countershaft necessary, as it is belted direct from the main shaft. The tight and loose pulleys are 4¾ x 1¾ inches and the cone has three changes of speed.

The Charging of Blast-Furnaces.

E. A. Uehling, superintendent of the blast-furnaces of the Bethlehem Iron Company, has contributed an interesting article to the July number of the *Stevens Indicator*, the quarterly publication of the alumni and undergraduates of the Stevens Institute of Technology. We quote from it as follows:

Since the direct combination of the C of the fuel with the O of the ore can only take place by actual contact, it does not require much meditation to arrive at the conclusion that such contact should be avoided as far as possible. This can be done to a limited extent in charging the furnace. The old method of charging was to mix the fuel and ore as much as possible, and the idea that this is the best method still prevails with the majority of "practical" furnace managers, who have little or no knowledge of the chemical reactions which take place in the furnace. Some time before the writer had the misfortune of having under his charge one or more blast-furnaces he had, by theoretical calculations, satisfied himself that the proper way to charge a blast-furnace would be to fill the ore and fuel in separate layers, but the practical furnace managers to whom it was submitted did not take well to the idea, and some of them even considered such a method hazardous. Finally, however, one was found who had sufficient courage to give the "new method" of filling a test. The following is an extract from a letter dated September 25, 1884:

"Two weeks ago yesterday we began filling 12 barrows of coke* (400 pounds to the barrow) at a time, and 12 barrows of ore with six barrows of limestone, which gives us an average depth of say 12 to 15 inches. We have kept this up since then with very gratifying results. The first week the furnace was on cinder mixture and the second week on all ore mixture, and in each case there has been a most marked improvement over any work the furnace has done in the past year. We find an improvement not only in increase of burden but in almost every other essential feature, viz.: uniformity in quality and quantity of product, increased production and decrease in quantity of flux (the latter feature I had not thought of). The trial showing results as follows:

	Per cent.
Increase in burden	12
Increase in production	10
Decrease in flux	5 to 8
Increase in quality—*i. e.*, make of No. 1 iron	25

The above certainly shows a marked improvement, and if the use of still larger charges will show a corresponding improvement it cannot help being of great advantage."

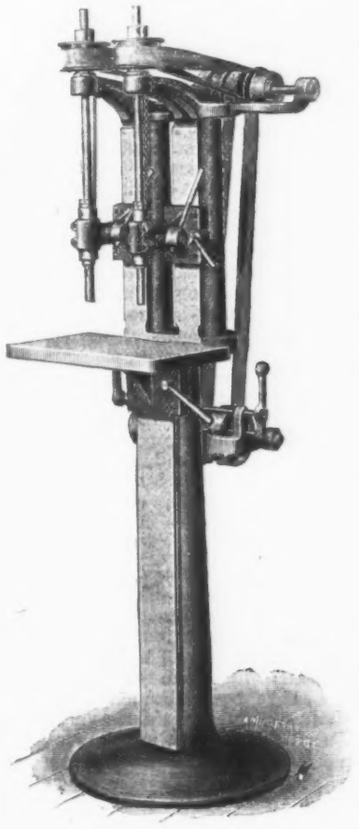
*Their usual method was to fill four barrows of coke and four of ore on top of coke in same hopper, dropping both together with the required limestone.

From another letter dated December 27, 1884, we quote: "We are still following your method of filling, with results equally as good as those we first advised you of."

The record of another furnace, from week ending March 27 to week ending November 6, 1886, shows the following:

22 weeks "old way" of charging, average weekly product	491 tons.
Average fuel consumption per ton of iron	2,549 lbs.
7 weeks "new way" of charging, average weekly product	559 tons.
Average fuel consumption per ton of iron	2,314 lbs.

The above furnaces use coke fuel, but the beneficial results gained by charging the fuel and ore in separate layers do not depend on the kind of fuel, as the following records of furnaces using three-quarter anthracite and one-quarter coke will show:



Two-Spindle Drill.

Furnace A was blown in June 3, 1885.
Furnace B was blown in June 23, 1883.
B was out for repairs from June 21 to August 8, 1887.
Furnace C was blown in January 12, 1884.
Furnace D was blown in April 20, 1886.

With the exception of B, there was no repairing done to any of the furnaces, the only change being that the writer took charge and gradually introduced the described method of charging during November and December, 1887.

Furnace A.

Year.	Total product.	Weekly average.	Fuel per ton of iron	Per cent. No. 1 and No. 2.	Per cent. gray forge	Per cent. mottled and white.
1887	16,132	310	1.79	93 97	4.98	1.05
1888	19,056	366	1.55	68.68	28.75	2.51
Furnace B.						
1887	23,324	496	1.25	89.93	6.99	3.08
1888	29,159	560	1.10	91.12	8.88	0
Furnace C.						
1887	20,970	403	1.50	12.68	80.29	7.03
1888	23,476	448	1.30	32 70	61.33	5.97
Furnace D.						
1887	25,326	487	1.30	37.48	59.65	3.86
1888	30,835	593	1.15	59.42	36.88	3.70

Furnaces A and C were equipped with iron-pipe stoves; B and D with fire-brick stoves. Furnaces A and C are both out for repairs, the record reaching almost to the end of the blast, which accounts for the quality not increasing as much as with B and D. Although there is quite a difference in fuel consumption in favor of the fire-brick stoves, the gain due to the change of filling in the latter is just as great as with the iron-pipe stove.

The Pennsylvania Steel Company, in connection with their new works at Maryland-Steelton, on the Patapsco River, propose the establishment of a great ship-building department for the construction of steel vessels. This department of the work will not, however, be developed until the new foundries and mills are all completed. The first of these improvements, a cupola-house, which is to be 169 feet 6 inches long by 87 feet wide, was begun a few days ago. The converter-house will be 120 long by 140 feet wide and 50 feet high, divided into three floors, and will have four cupolas for melting iron and two 15-ton Bessemer converters for converting the iron pigs into steel ingots. Next to the latter building there will be built a blooming-mill and rail-mill. It will be 80 feet wide and 850 feet long. The minimum production of this mill will be 1000 tons of steel rails per day. There is also being dug by the company from their property front to the Craighill Channel a channel 6000 feet long, 200 feet wide and 27 feet deep, one-half of which is already finished and in use by the ships now bringing iron ore from Cuba.

The Master Builders' Exchange in Philadelphia will soon open a well-equipped trade school on the plan of Colonel Auchmuty, of New York. At least 600 boys can be accommodated during the school year, each being taught whatever branch of the builder's art he may elect. The basement of the exchange provides about 6000 square feet, in which the "industrious 'prentice" can disport himself with anvil, trowel, paint-brush or whatever may be the distinctive mark of his guild. Brick-layers, plasterers, plumbers, carpenters, blacksmiths and stonecutters will there be manufactured, instruction being given in each branch by a practical worker at that trade. Each of the seven departments will be in charge of a committee of three members of the exchange, and the chairmen of these seven sub-committees will form the Executive Committee, upon which will rest the entire control and direction of the school. It is proposed to have the school open six nights of the week. The pupils will be divided into three classes, each numbering about 200. The school will probably be made self-supporting, so far as tuition is concerned, and $30 per term has been named as the fee to be exacted from each boy.

The leading men of the American Federation and Knights of Labor held a secret conference in Philadelphia last week for the purpose of discussing the eight-hour question and agreeing upon a general plan for carrying the scheme into effect next spring. The knights, it is understood, said they had no desire to oppose the eight-hour movement of the federation, but hoped it would succeed. Mr. Powderly, it is said, declared that a majority of the local assemblies of the knights had already voted in favor of the adoption of the eight-hour day, and that the question was bound to come before the next general assembly of the order, which meets in Atlanta, Ga., next November. Samuel Gompers, of New York, president of the American Federation of Labor, is regarded as the head of the movement.

THE WEEK.

Prominent Chinese officials at Pekin urge that all Americans employed in the empire shall be expelled as an act of retaliation against the United States. They number about 1200.

Competition between Russian and English buyers in the Chinese tea market is so fierce that, according to Minister Denby, prices have never been so high as at the present time, and this despite the competition of India as a tea-producing country.

Destructive fires are sweeping through Northern Montana, consuming lumber-mills and immense quantities of cord-wood collected by the mining companies. Bone gatherers on the prairies are charged with the mischief.

By an explosion in Messrs. Carnegie, Phipps & Co.'s steel-works at Homestead on Friday one workman was killed and several men were injured.

The Columbia, the new racer of the Hamburg-American line, arrived on Friday after making the trip from the Needles to Sandy Hook in 6 days 18 hours and 20 minutes, beating her own and all previous records in this distance.

The Viceroy of Canton proposes to develop the iron industry of the empire. He has abolished the inland duties on iron and the prohibition against its export, and generally seems to favor the more extended use of foreign methods in building railroads and foundries.

Acting Secretary Walker is confident that as a result of the modification of the requirements in the case of the three 2000-ton cruisers there will be many proposals, and that the Department will secure bids within the $700,000 limit fixed by the law

The first coal train crossed the Poughkeepsie Bridge on Monday, accompanied by a noisy demonstration from steam-whistles in every direction.

The machinery of a cotton-mill at Wilmington, Del., is being shipped to Reidville, N. C.

To what is already known of the productions of the great State of Texas in the cereals, in wool, in cotton, in sugar and in cattle—in addition to her minerals—there is now to be added very promising probabilities in coffee, Sea Island cotton and the finer grades of tobacco. Although the coffee-planting is still in the experimental stage, the trees being at some risk from occasional slight frosts in the late autumn, still the Agricultural Bureau has the record of a planting in Cameron County, near the twenty-sixth parallel of latitude, where every seed that was planted germinated, the planter writing that he now has about 150 young trees from 12 to 18 inches high, and all strong and healthy.

The great postal-card contract has been transferred to Wilkinson Brothers & Co.'s mill, at Shelton, Conn.

The franchise of the Broadway surface railroad was sold, subject to all its obligations, for $25,000, to Daniel S. Lamont. The sale was by order of the trustees, in behalf of the stockholders and creditors.

Wm. E. Dodge suggests to Mayor Grant that he should seek a conference with the distinguished Japanese delegation now visiting this country, one of whom is the Secretary of the Interior, with reference to the world's fair of 1892.

An important contract was signed on the 28th ult. between the City of Mexico and Read & Campbell, large English contractors, for an extension of the valley drainage tunnel 4 miles, making the entire length of the tunnel 9¼ miles, the work to be completed within three years after signing the contract. The tunnel is to connect with the canal that is to convey the surplus water beyond the valley and takes the place of the projected deep cut. This firm hold a sub-contract from the Mexican Company, of London, who negotiated a municipal loan for a 9½-km. tunnel, of which the four-mile contract just signed becomes the city end, the other end, an open cut, having been completed.

Speaking of the necessity of introducing improved machinery for the profitable production of sugar, the New Orleans *Times-Democrat* says: "The product of a ton of cane, worked for all it is worth, but not by 'common mills' and cheap machinery, would be worth from $12 to $13. In unusually fine harvesting seasons, with a high sucrose in the cane, more than 200 pounds per ton could be obtained from it. In unfavorable seasons the yield would be less. These figures are not based on the average results of the large central factories in this State; they are founded on practical results obtained from the most perfect sugar-houses in this State last year, establishments using diffusion and mills. A dozen factories in the State last year made over 165 pounds of dry sugar per ton. If the Rapides people figure down as low as these estimates they can still find an enormous margin of profit in sugar culture and manufacture. But the first requisite to profitable sugar production is to get the very best and the most modern machinery, whatever it costs. Such machinery gains 100 per cent. in its result over the old forms of machinery employed."

It is doubtful whether the census to be taken next year will show any increase in the population of Vermont. The State is an agricultural State, but farming in Vermont does not pay. The people who stay there are drifting into the towns. Many farms have been abandoned, the farm buildings and fences are decaying and the once cultivated fields are growing up in timber. Farm lands that were worth a few years ago $5 an acre can now be bought for $2 or $3, and a serious effort is being made to repopulate some portions of the State by bringing into it a colony of Swedes used to lives of hardihood and strict economy. This is a sad story, but it is not overdrawn.

The Philadelphia *Press* prints a long article on the projected bituminous coal trust which is being organized in that city by a syndicate. The plan embraces the consolidation of all the coal mines with their tributary territory lying along the Monongahela and Youghiogheny rivers in Pennsylvania. The necessary outlay to accomplish this purpose is $13,000,000. The discovery and utilization of natural gas, it says, has contributed in a marked degree to the demoralization of the coal trade along the Monongahela River and actually forced many of the smaller operators out of business. Cincinnati, Louisville, St. Louis, New Orleans and other cities of the Mississippi and Ohio valleys still remain in the market and the formation of a trust is merely an effort to control the field of consumption.

At the present moment Mr. Villard occupies a very conspicuous position in Wall street, almost jostling Mr. Gould. He is known to be an operator bold to the verge of audacity and backed by an influential following. The speculative element in the street always favors activity in the market, and Mr. Villard's ability as a skillful manipulator excites their admiration, though the conservative element regards him as a rather dangerous pilot in Wall street affairs. His latest plan to issue $160,000,000 of bonds to unify and refund an outstanding indebtedness of about $120,000,000, and provide at the same time for the floating debt and money necessary for improvement of the physical condition of the road, as well as the construction of several branches, was at first looked upon as visionary, but since its unanimous adoption by the Northern Pacific board the public is inclined to believe that the scheme will be pushed to as nearly a successful result as can be effected by Mr. Villard, backed, as he appears to be, by influential German capitalists.

The new tax rate in New York City is lowered to 1.95, while the valuations were increased, so that as compared with last year the tax-payer derives little comfort.

Norton's Point, on Coney Island, has passed into new hands, by whom a grand public-house to cost about $1,500,000 will be erected.

The extreme rapidity with which steel has superseded iron for ship-building is remarkable. The Iris, built in 1875, was the first war vessel constructed entirely of steel. Between 1866 and 1876 only three small ships were built of steel in the United Kingdom, and the decision to build the Cunarder Servia, launched in 1881, of steel was even at that recent period considered a very bold one. All new ships of war and the greater number of ships for the merchant service are now built of steel In 1878 there was 90 times as much iron as steel used for steamers. In 1887 there was more than 8 times the quantity of steel used, as compared with iron, for the same purpose. There are now 528 vessels under construction in the United Kingdom, requiring 500,000 tons of steel.

The Thames River draw-bridge, in Connecticut, is spoken of as the finest and largest steel draw-span wood-girder railroad bridge in the world.

The Choctaw Coal Railway, in the Indian Territory, is designed to reach the Oklahoma country, and a heavy coal trade is expected.

Thirty years have passed since the discovery of petroleum on the Drake farm, near Titusville, Pa. The maximum production was in 1882, when the total exceeded 30,000,000 barrels. Last year the yield dropped to 16,000,000, as compared with 21,000,000 barrels the previous year, partly owing to the "shut-down" movement. The State Geologist says the oil fields are being rapidly depleted.

California last year produced deciduous fruits valued at $8,000,000, of which 20,500 tons, or about one-sixth, were exported to the East and foreign countries.

The iron pipe for the conveyance of oil across Manhattan Island from the wells near Olean, N. Y., to the refineries at Hunter's Point is about to be replaced by a 6-inch double pipe, one pipe within another. The intermediate space of ⅛ inch will be filled with lead.

Wm. H. Webb, of ship-building fame, writes of the exploits of five ships built in this city about 50 years ago, each of about 800 tons. One of these, the ship Natchez, made the passage from Hong Kong to New York in 90 days under Captain Waterman. Mr. Webb closes his narrative with the touching remark: "All these ships have disappeared, their captains and owners dead, including all those of the Collins Line, as also their builders—the writer only surviving." The events of 50 years—most notably the introduction of iron and steel as a substitute for wood—have sufficed to drive out of existence the entire *personnel* and material of the commercial marine of New York City,

whose achievements in by-gone days were the pride of the commercial metropolis and the nation at large.

Very few Chinese are arriving in British Columbia, and the local Chinese population is fast decreasing.

The American Minister to Hayti, Mr. Thompson, entered Port-au-Prince at the head of Hippolyte's victorious army, together with the only unfurled standard in the procession, the American flag. It was pronounced a genuine triumph for the American Admiral Gherardi and Mr. Thompson, who received the cordial congratulations of General Mompoint, Hippolyte's Minister of War.

A commercial conference of representatives of trade in various parts of California was held in San Francisco last week in response to the call of the Chamber of Commerce, and a variety of subjects were discussed, preparatory to the meeting of Congress. The committee having in charge the report on the encouragement of maritime commerce reported an amendment striking out all reference to free ships and inserting a clause providing for the establishment of a permanent bureau of navigation and urging Congress to provide for the payment of bounty to all builders of vessels to be engaged in foreign trade. The report as thus amended, with a proposition suggesting the adoption of the French bounty system, was unanimously adopted. The report favoring the Pacific Ocean cable was submitted and also adopted. The report of the Committee on Coast Defense was submitted, together with a resolution urging Congress to put all the harbors and rivers of the Pacific Coast—viz., Puget Sound, Columbia River, Coos Bay, Yaquina Bay, Humboldt, San Francisco, San Pedro and San Diego harbors—in thorough condition of defense; also favoring a proposition to keep Mare Island Navy Yard in full working order at all times, and to establish additional navy yards on the northern coast. The report and resolutions were adopted. A report favoring the construction of the Nicaragua Canal was adopted.

A telegraphic money-order service began in 18 cities of Great Britain last Monday. The method differs little from that of the mail-order system.

Ship-yards in Maine and Connecticut are more active than before for many years. The demand is principally for schooners in the coasting trade, where there is now a scarcity of tonnage. Eastern builders are confident that wooden sailing vessels for domestic trade will never be superseded by steam or steel. There are 15 vessels on the stocks at Bath, of which a dozen will cost from $40,000 to $50,000 each.

The project for establishing a steamship line to Africa, and in connection with it a Transcontinental African railway 3000 miles in length, from Monrovia, in Liberia, to the Straits of Babel Mandeb, on the Red Sea, will be revived in the next Congress, under the auspices of the American Colonization Society. It is proposed to invest $3,000,000 of private capital after Congress shall have appropriated $25,000 for a preliminary exploration of the land route, a work which it is said ex-Commodore Schufeldt, U. S. N., would willingly undertake. The memorial to Congress will set forth that the commerce of Africa at this time attracts the attention of many nations, the share therein of England being estimated to amount to $125,000,000 annually; that the yearly value of the trade of the United States with Africa is comparatively small and insignificant, yet not one of the nations whose agents and citizens are now engaged in the exploration of that vast continent with a view to opening new markets for the products and surplus of a manufacturing civilization has a deeper commercial interest in this development than the United States, which has through its daughter, the Republic of Liberia, an access to the Niger and the Central Soudan regions of interior Africa not surpassed anywhere, and the memorialists earnestly ask Congress to aid in the establishment of a line of monthly steamers to carry the mails direct between the ports of the United States and West Africa, as largely promising to promote American commerce in one of the richest marts and most populous portions of the world. It is represented that now is the time for action before this great Central African Continent becomes disintegrated by the encroachment of foreign nations by degrees on its territory.

The street-car lines of Des Moines, Iowa, have consolidated and will probably be run by electricity.

Immigration into the United States continues to decline, largely owing to the rival attractions of the Argentine Republic, Brazil and other South American countries. Statistics carefully compiled at Castle Garden show that in the eight months since January 1 last the total arrivals number 222,056, which is a falling off of 72,135 in the number of immigrants landed there as compared with the same months in 1888. In no month of the present year thus far has the number of immigrants who passed through the garden equaled the number who arrived during the corresponding month last year.

A Bicycle Engine.—A novel form of engine built for the Boynton Bicycle Railway Company, of this city, will shortly be tried at Gravesend, where a track has been built. The engine is considerably higher than the ordinary locomotive, and in addition to the usual wheels with which common locomotives are equipped, it has a driving-wheel 9 feet in diameter, which is fixed in the center of the engine a little forward of the boiler. The wheel is designed to run on a rail placed between the two outer rails, and is relied upon to send the engine along at the rate of 80 miles an hour. The cab of the engine is divided into two stories, the upper of which is occupied by the engineer and the lower by the fireman. The engine rests upon four two-wheeled trucks, arranged in much the same way in which the trucks of ordinary cars are placed, except that the wheels are double-flanged, and have, instead of the plain wheel-axle, bicycle spindles. It is proposed to use an overhead wooden rail, placed upon which will run wheels fastened to the roof directly above each truck. These wheels are practically guiding-wheels to prevent the engine from leaving the track. It is claimed that this plan possesses the following advantages: Reduction in first cost and wear of rolling-stock, greater speed and safety.

The American Wire Nail Company, of Covington, Ky., have filed a complaint with the Interstate Commerce Commission against the Queen and Crescent Fast Freight Line. The complainant alleges that his company were charged 40 cents per hundredweight for transporting wire-nails packed in kegs from Cincinnati to Chattanooga, Tenn., while only 15 cents per hundred was charged for transporting iron nails from Cincinnati to Chattanooga, which difference, complainant says, is quite a burdensome discrimination for the reason of the precise similarity in value and character of the nails.

It is claimed that 50 pounds of aluminium per day are being made by the plant of Hunt & Clapp, Pittsburgh.

MANUFACTURING.

Iron and Steel.

In our issue of last week we made mention of the fact that Emaus Furnace, at Emaus, Pa., formerly operated by the Donaldson Iron Company, had been leased to Pancoast & Rogers, of New York City. It is stated on good authority that Robert Coleman, of Cornwall, Pa., is also interested in the furnace. Extensive improvements are now being made to the plant.

The Calumet Iron and Steel Company, of Chicago, having abandoned the manufacture of nails, have converted their nail-plate train into a bar train for rolling large sizes. They will now be able to roll bars up to 10 inches in width, and can thus meet the demand for a full assortment, including small flats, rounds and squares and guide-irons. Their nail factory has been boarded up, while the nail warehouse will be used for a shipping-room.

The Hollidaysburg Iron and Nail Company and McLanahan, Smith & Co., Limited, of Hollidaysburg, Pa., have advanced wages of their puddlers from $3.50 to $3.75 per ton. Both plants are being operated to their utmost capacity.

Sharon Furnace, at Sharon, Pa., owned by Boyce, Rawle & Co., but recently leased by Hall & Co., will be put in blast during the present month. It is now undergoing extensive repairs.

The employees of the Pennsylvania Steel Company, at Steelton, Pa., have recently joined the Amalgamated Association of Iron and Steel Workers. The plant has heretofore been operated by non-union men.

The mill of William McIlvain & Sons, at Reading, Pa., has resumed, the puddlers being granted an advance from $3.20 to $3.75 per ton.

We are informed that the report that a part of the plant of Shoenberger & Co., at Pittsburgh, was idle on account of a scarcity of coke is without foundation. All departments of the company's plant are in full operation, with excellent prospects for a steady run.

The new employees of the Allegheny Bessemer Steel Works, at Pittsburgh, Pa., who took the places of the strikers last spring, struck on Monday against a new scale presented by the firm. On Saturday the firm offered a scale to the employees by the acceptance of which, the firm claimed, more money could be made by the workers. Sunday night the scale was presented to the men on the night turn, but they refused to accept it and struck. Yesterday the same thing was done by the day turn and the mill is idle. Above 500 men are affected.

A very serious accident attended with loss of life occurred at the Homestead Steel Works of Carnegie, Phipps & Co., Limited, at Homestead, Pa., on the afternoon of the 30th ult. The accident occurred in the open-hearth department, where an immense ladle containing 30 tons of molten steel boiled over, throwing the liquid metal over the pit men. Five men were so severely burned that they died a short time after, and three others were also severely burned. Superintendent C. M. Schwab stated that he could not understand what caused the accident, as there was no explosion. The loss to the plant is small, and will not interfere in any way with operations.

A press dispatch from Allentown, Pa., under date of the 30th ult., says: "The filling of the Topton Furnace stack has been completed, but it is still uncertain when it will be lighted. There is little coke on hand, and the managers are wait-

ing for a bigger supply before starting up, so as to make sure that no loss or stoppage will occur through a deficient supply. From what is known the coke now on the way will soon arrive, and the furnace will be put in blast. Already a delay of three weeks has been occasioned by reason of the coke strike."

The entire plant of the Centralia Iron and Nail Works, at Centralia, Ill., has been closed down for an indefinite period.

The Jefferson Iron Works, of Steubenville, Ohio, are operating about two-thirds of their nail machines and are running them on light nails.

The Scaife Foundry and Machine Company, Limited, of Pittsburgh, have just completed the erection of a machine for making railroad ties. It weighs nearly 50 tons and when erected ready to be set in motion will be about 15 feet high, and will be operated by five hydraulic cylinders. The machine has been constructed for the Standard Metal Tie and Construction Company, of New York City, and this firm have made arrangements with Carnegie, Phipps & Co., Limited, of Pittsburgh, to place it in the Homestead Steel Works, at Homestead, Pa., where the ties will be made by the Standard Company and the material will be furnished by the Carnegie concern.

The Thomas Furnace Company, of Niles, Ohio, have expended nearly $50,000 the present year making improvements to their plant.

The National Forge and Iron Company, of Chicago, have their new rolling-mill at East Chicago, Ind., nearly completed and expect to be able to start up not later than the 16th inst. They have already taken orders for bar-iron sufficient to keep the works running for some little time. The orders booked thus far are for car-iron. The forge which the company are building will not be finished as soon as the rolling-mill and probably 60 days will elapse before they are ready to turn out axles.

The mill of James Hooven & Son, Norristown, Pa., manufacturers of skelp and pipe, has started part time.

A statement is going the rounds that the Pennsylvania Bolt and Nut Company, of Lebanon, Pa., have sold out to an English syndicate. There is no truth in this assertion, the plant remaining under the same ownership and management, with Henry S. Eckert as president, James Lord as secretary and treasurer and H. V. L. Meiggs as superintendent.

The bosh of Irondale Furnace, at Independence, W. Va., owned by F. Nemegyei, is to be enlarged to 14 feet, and the heating capacity from 4900 to 29,000 square feet by the erection of a Gordon-Cowper-Whitwell stove. The blowing capacity will be increased to 10,000 cubic feet per minute. In the beginning many faults were encountered in the new ore mine, but the workings have now sufficiently penetrated into the mountain to open up the territory in an undisturbed condition, the average being about 24 inches. A noteworthy point is that the iron produced at the Irondale Furnace has been pronounced by the Hoerde Works in Germany as very suitable for the manufacture of basic steel.

The furnace of the Tonawanda Iron and Steel Company, at Ironton, near Tonawanda, was blown in on the 28th inst. It is the old Niagara furnace built in 1873 by P. P. Pratt, S. S. Jewett, Francis H. Root and George B. Hayes. Last fall the property was leased for five years, with privilege to purchase it, by F. B. Baird, who secured the co-operation of the well-known firm of Rogers, Brown & Co. The plant was remodeled under the supervision of John Dowling. The furnace is 16½ by 61, heated by Ford stoves. Its capacity is estimated at 100 to 125 tons a day, running on Rochester and Pittsburgh Company coke, three-quarters Lake Superior and one-quarter Lake Champlain ore. F. B. Baird is president, Archer Brown vice-president, S. S. Willet secretary and treasurer and John Dowling furnace manager. The Buffalo office is in the Coal and Iron Exchange Building.

No. 1 Paxton Furnace, at Harrisburg, Pa., was blown in on the 3d inst.

The Crane Iron Company, Catasauqua, Pa., blew in an additional furnace on the 25th ult.

Machinery.

All but eight of the locomotives that were wrecked at Conemaugh and Johnstown during the flood have been received at the shops of the Pennsylvania Railroad Company at Altoona, Pa. Seven have been repaired and are now doing service on the road.

The New Bedford Iron Foundry, Edward Grinnell, proprietor, was burned on Monday; loss about $18,000.

Lane Mfg. Company, Montpelier, Vt., manufacturers of wood-working machinery, are erecting a new foundry building, 130 x 60 feet, with a wing 30 x 60 feet, to be used as a store-room for coal and iron; also an engine and boiler room 30 x 60 feet, and a molding-room 84 x 30 feet. These improvements will be completed in a few months and will double the capacity of the works. More additions are planned for next year, which will include a new machine-shop.

The Chesapeake Dry Dock and Construction Company, of Newport News, Va., are vigorously pushing the work of building what, it is understood, shall be the largest ship-building plant in this country. The land is being graded for the regular ship and engine building shops. The bulkheads are built around the water-front of the yard, the filling is going on and the piles are being driven for the ship-ways. Tools have been ordered for the regular plant. A 100-ton crane, or shears, for lifting machinery into and out of vessels, is under way. The dry-dock is already built and in successful operation, as well as large repair-shops for both ship and engine work.

A pipe-bender for which letters patent were recently granted to E. L. Burgoin, of Los Angeles, Cal., consists of a cylindrical spiral spring, adapted to be inserted in the pipe to cause the latter to retain its cylindrical form while being bent. Extending through the spring is a link bar resembling somewhat a flat chain, which is secured at one end of the spring and provided with an extension at the other, by means of which it may be turned. It is evident that the turning of this link bar will either expand or contract the spring, which may by this means be made to closely fit the interior of the pipe, so that when the latter is bent it is prevented from kinking by means of the resistance offered by the spring.

Miscellaneous.

The New York Central road has awarded contracts for 56 new locomotives. The Brook Locomotive Works will make 10, the New York Locomotive Works 22 and the Schenectady Locomotive Works 24.

The Gurney Hot-Water Heater Company, Boston, Mass., have issued a couple of circulars relating to their well-known heating apparatus and radiators. The larger of the two presents a general view of the Gurney Hot-Water Heater, printed in colored ink, while on the opposite page is a cut of the Gurney Hot-Water Radiator. The front page of the circular contains a general notice of the heater, in which its chief points of advantage are referred to, and on the last page a full description is printed. The smaller circular refers exclusively to the Gurney Hot-Water Radiator, and, in addition to cuts and description, a tabulated price-list is presented, in which the dimensions and radiating-surface of the several sizes are given.

Ludlow-Saylor Wire Company, St. Louis, Mo., report a greatly-increased business for the month of August, and state they are at least four weeks behind their orders. They have lately closed several good-sized contracts for office-railing, cemetery inclosures, &c., and from present appearances will be kept comfortably employed for some months to come.

The Royal Steam Heater Company, Gardiner, Mass., report business better than ever before, and refer to the fact that they have not found it necessary to make any changes whatever in the original design of the apparatus. They will, however, soon add hot-water heaters to their line.

It is stated that experiments recently tried on the Philadelphia and Reading road have demonstrated that the tractive power of the engine can be augmented by passing a current of electricity through the drivers and rails. On one of the steepest grades a train made the trip in 28 minutes, the usual time being 55 minutes. Electro magnets have been tried heretofore to increase the tractive power, the magnets being held just above the rails, but the method never received much attention.

Mason & Davis Company, Chicago, have taken control of the R. F. Brown Radiators for water and steam, and will hereafter manufacture and sell them. In a circular recently issued to the trade they say: "The desirable features of the R. F. Brown radiators are that the greatest possible amount of radiating-surface is obtained in the least possible space; they can be set under windows and in out-of-the-way places not needed for other purposes, and consequently are not always in the way, as is the case with any other radiator of less compact radiating-surface. The window radiator can be made with a hard wood top, finished to correspond with the wood finish in room and forming a comfortable seat, thus making it an attractive piece of furniture, instead of presenting the unsightly appearance of a wall radiator."

Charles Himrod & Co., of Chicago, pig-iron commission merchants, have purchased the Sheldon & Shaffer iron-ore mine at Crystal Falls, Mich., in the Menominee district. This mine has been worked to but a limited extent by an open pit, but the new owners propose to introduce better methods and push operations far more vigorously. A large body of non-Bessemer ore has been opened up on the property and analyses have shown it to run from 61 to 62 per cent. in metallic iron. Preparations will be made this fall and winter for regular shipments next year.

The Page Steam Heating Company, Norwich, Conn., have opened a branch office at 16 Post-Office square, Boston, in charge of John Polley.

It is announced that H. C. Frick & Co., the largest coke operators of the Connellsville region, have secured control of the J. M. Schoonmaker coke plant, which includes 5000 acres of coal land, 1500 coke ovens and 400 cars. This, with the 579 ovens recently purchased from J. W. Moore, will give Frick & Co. control of over 9000 of the 14,000 coke ovens in the region. Before long, it is said, their holdings will be further increased. The price paid Schoonmaker and Moore is not known.

The Iron Age

New York, Thursday, September 5, 1889.

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GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

The Outlook.

Day by day the business prospects are growing brighter. Reports concerning the crops are very favorable for all the leading agricultural products, while news from the principal competitive countries indicates that our surplus will be readily taken at remunerative prices. This means prosperity to our greatest—the agricultural—interest, to the railroads and to all the industries dependent upon them. Even now railroad earnings are creeping up steadily, and with growing business the temptation to cut rates is disappearing. What an influence this tendency will have upon the iron trade will be readily appreciated by a brief review of the situation.

Consumption of iron and steel in all the forms which enter into miscellaneous forms has been enormous. The most tangible proof is furnished by the pig-iron statistics. The reports of activity in shipbuilding, in the machinery trade, in the cast and wrought pipe trade, in the wire business, in car and bridge building, all corroborate it. Thus far, however, the rise in values has been pretty nearly confined to raw materials.

The second great factor influencing our near future, and, let us add, responsible to a considerable extent for the volume of business thrown into the hands of our home works, has been the rapid rise of prices abroad. It has cut down importations to close figures, and what is more important, has practically stopped the flow of orders to European works for months to come. Where in former years importers at this time were actively taking business for delivery prior to the close of navigation and were entering contracts for shipment till the succeeding spring, they have done nothing thus far. Nor does there seem the slightest chance that they will accomplish anything during the present season, since we are considerably below the parity of European prices, which continue to rise more rapidly than they do with us.

The only quarter from which the demand has been slack thus far is from the railroads for rails. The time is near when a considerable share of that business is usually placed. During September and October the greater part of the orders for winter and spring delivery come into the market. If they are heavy then there will be an enormous demand for ore, pig-iron and coke, soft steel, the basis now of so many industries, will rise rapidly and our capacity will be strained in every direction.

We have already alluded to the fact that poverty alone has led the railroads to withhold thus far a very large amount of renewal work, the necessity of which is recognized by railroad officials. With the heavy business which good crops, now probable, will throw upon the railroads, their net earnings will come up readily. Requisitions for material of all kinds, long shelved by boards of directors, will be presented more urgently. They will receive more consideration and far greater quantities will be approved.

With the exception of one or possibly two branches of the iron and steel trades hopelessly mired in excessive capacity, the direct and indirect effects of large crops at good prices and of swelling net earnings with the railroads will cause a rapid rise of prices all along the line. Consumptive and productive capacity are very nearly balanced now. Even a modest increase in rail orders will tip the beam heavily. The next two months will tell the story, with, it seems to us, all indications favoring a substantial advance.

Ship-Building in 1888.

So long as the values of raw colonial and tropical products were depressed ocean navigation was under a cloud. The producers were getting impoverished, the producing countries attracted less immigration and they lacked the means to buy luxuries. All this promptly changed when wool advanced and coffee, India rubber and, finally, sugar followed. Ocean freights began to appreciate, and it was soon discovered that the demand for ship's room had commenced to outrun the supply of available craft of a desirable description. The movement coincided with a growing demand for steel steamers and sailing vessels. In the course of a six-month ocean freights advanced 50 per cent., and a great impulse was given to ship-building, the movement extending over the whole year. The result is shown in the following table:

Vessels of Over 100 Tons Register Built.

	1887. Number of vessels.	1887. Tonnage.	1888. Number of vessels.	1888. Tonnage.
England	329	477,107	484	776,993
United States	68	38,673	73	38,198
Germany	27	23,111	37	39,994
British Colonies	39	12,220	68	17,106
France	12	10,251	14	10,721
Russia	14	3,432	7	1,713
Sweden	13	3,095	15	4,088
Denmark	5	2,485	5	5,721
Norway	6	2,328	19	11,433
Greece	9	2,253	15	3,086
Italy	9	1,252	8	1,798
Holland	2	717	3	5,156
Austria	2	570	5	5,038
Other countries	4	2,285	12	5,478
Totals	539	579,779	765	926,523

The decrease through shipwreck, &c., in 1888 did not exceed 563,541 tons. In 1885 England's share of ship-building was 72 per cent., in 1886 71 per cent., in 1887 82 per cent. and last year 84 per cent. of the whole. There were so many orders that some had to be executed abroad. Germany, which in 1886 promised to become quite a competitor, only built 39,994 tons, against 48,778 tons in 1886. In the United States activity in ship-building remained steady, while being less so than in 1885. In the British Colonies the industry has not flourished, and while the building of sailing vessels has been gradually on the decline, their ability to turn out iron and steel steamers is not yet fully developed owing to high wages. They built in 1885 34,946 tons of vessels; in 1886, 25,705 tons; 1887, 12,220 tons, and in 1888, 17,106 tons. The premiums granted by the French Government do not seem to have had the desired effect of much stimulating the industry in France. The falling off from 24,162 tons in 1885 is considerable. Even Norway has outstripped France, now taking as it does the fifth place in rank, while in 1887 Norway stood ninth on the list. The other countries have made tolerably good headway.

The following is a summary of the steamers built:

Steamers Built.

	1887. Number of vessels.	1887. Tonnage.	1888. Number of vessels.	1888. Tonnage.
England	268	406,112	422	699,613
United States	26	18,711	28	15,496
Germany	19	15,029	33	33,834
France	7	9,225	10	9,623
Sweden	11	2,381	11	2,973
Denmark	3	1,829	4	5,5 2
British Colonies	8	1,421	18	4,865
Austria	1	470	3	4,318
Norway	1	419	4	2,742
Holland	1	321	2	4,149
Italy	..	....	3	1,095
Russia	..	....	2	630
Other countries	1	1,753	8	3,815
Totals	346	457,671	548	788,655

Sixty-seven steel steamers, registering 110,908 tons, and 9 iron steamers of 9662 tons, together 88 steam vessels of all kinds and sizes, of an aggregate tonnage of 138,935, were built in England last year on orders from abroad. Germany has displayed an extraordinary amount of activity not only for account of domestic ship-owners, but for Danish, Russian and Brazilian account. The United States kept about steady, and so did Italy. Sweden receded somewhat from 1886, when it built 12 steamers of 4596 tons. Other countries made some progress. Denmark built 1 steamer for foreign account, Sweden 2 for Russian and France 1 for South American. The United States built a wooden steamer for the Sandwich Islands. The average size of steamers built throughout the world was 1322 tons in 1887; in England alone it was 1515; in 1888 the figures were 1439 and 1657 respectively.

The iron sailing craft built in the world is summarized as follows:

Sailing Vessels.

	1887. Number of vessels.	1887. Tonnage.	1888. Number of vessels.	1888. Tonnage.
England	61	70,995	62	77,380
United States	42	19,962	45	22,702
British Colonies	38	10,799	50	12,241
Germany	8	8,082	4	6,190
Russia	14	3,432	5	1,083
Greece	9	2,353	15	3,086
Norway	5	1,909	15	8,691
Italy	9	1,252	5	706
France	5	1,026	4	1,098
Sweden	2	714	4	1,115
Denmark	2	656	1	219
Holland	1	396	1	1,007
Austria	1	100	2	720
Other countries	3	532	4	1,663
Totals	193	122,108	217	137,868

In 1885 354 sailing vessels were built, with a joint tonnage of 288,177; in 1886, 269, with 205,526. England furnished last year not quite one-half of the new ships; Norway, the United States and British Colonies the greater number next, while the remaining nations fell off. Of those built in England 3 were iron and 9 steel, registering, together, 18,365 tons. Austria built a wooden vessel for Greece and Japan 1 for a British colony. The size has been declining; it averaged 814 tons in 1885, 764 in 1886, 632 in 1887 and 635 in 1888; in England alone the figures

were respectively 1307, 1378, 1163 and 1248. Classified by material, the record stands:

	1887.		1888	
	Number.	Tons.	Number.	Tons.
Iron	121	109,326	106	75,382
Steel	259	418,701	451	780,496
Wood	154	50,784	203	68 300
Composition	5	968	5	2,345
Totals	539	579,779	765	926,523

The foregoing shows that nine years after the introduction of soft steel four-fifths of all vessels are built out of it. In 1885 the percentage was 30, 45 in 1886, 72 in 1887 and 84 in 1888. All nations, if we except Greece and Italy, have used it last year for the purpose. Thus Germany built 31 vessels of jointly 36,289 out of steel, out of a total built of 37 and a tonnage of 89,994. England built of steel 390 vessels, aggregating 713,705 tons, being 90 per cent. of all she turned out.

France takes the third place in the use of steel for vessels, having built 8 steamers of together 9295 tons; next follows Denmark, with 3 steamers and 4868 tons; then Austria, with 2 and 4522, and after the latter the United States, with 2 and 4208 tons. Holland, Sweden, Norway and Russia all used steel for vessels. Out of wooden vessels built nearly 25 per cent. were steamers:

	1887.		1888.	
	Number.	Tons.	Number.	Tons.
Iron	18	24,359	88	51,023
Steel	43	58,944	408	721,552
Wood	155	54,310	48	13,990
Composition	1	255	4	2,090
Totals	217	137,868	548	788,655

The bulk of the wooden steamers, 25 with 8,421 tons, were built in the United States. The British Colonies built 16 with 3518, and the remaining countries 7 with 2051. The United States built last year more wooden sailing vessels than any other nation, the tonnage summing up 22,702; next came the British Colonies, with 10,992; Norway, with 8691; Greece, with 30,086; Germany, with 1663, and England, with 1282.

Our Progress in the Production of War Material.

When in 1882 Congress first authorized the construction of the first modern ships of war practically no facilities existed in this country for the manufacture of the heavy material required for their armament or their protection. Ensign J. B. Bernadou, U. S. Navy, in a chapter forming a part of the volume on "Naval Mobilization and Improvement in Material," published by the Office of Naval Intelligence, briefly puts our position at that time thus: "The first armor-plates and heavy-gun forgings were procured from England; electric search lights were not to be had of domestic make, and were purchased in France; the earlier supplies of powder for our heavy guns came from Germany." It is creditable to American manufacturers and to naval officers alike that now, seven years after the first step was taken, the United States is independent, so far as construction, armament and equipment are concerned, of foreign sources of supply. At the end of this year we will be able to build the heaviest iron-clads and equip them and our forts with the heaviest guns.

Mr. Bernadou traces the course of development of the resources for the production of war material. It has been a period of daring enterprise, earnest work, heavy pecuniary sacrifices, considerable friction and occasional disappointments. The story of the obstacles met has not and probably will never be told. The trials and tribulations may well be forgotten in the contemplation of the results obtained. It is with these that the review referred to deals. Mr. Bernadou is inclined to attribute much of the success obtained to the establishment and maintenance of a rigid system of government tests. It is not worth while to discuss the question whether at times that system did not tend to unnecessarily embarrass manufacturers and hamper progress. We agree with him in admiring the achievements attained, but hold that the credit for it is chiefly due not to those who held the standard high and were relentless in exacting, but to those—the American manufacturers—who attained it.

The history of the manufacture of large shafts is typical. The contracts for the shafts of the Dolphin, Atlanta, Boston and Chicago, which were to be of steel, had to be modified to allow of the use of iron. For those of the Charleston, the Baltimore, Yorktown and Vesuvius recourse was had to foreign makers. The 9-inch steel shaft of the Petrel was forged by the Duquesne Steel Company. Bethlehem undertook those of the Newark, Philadelphia, San Francisco and Maine, and Midvale those of the Concord, Bennington and Monadnock.

In large steel castings for stems and stern-posts for the later ships the Standard Steel Casting Company, of Thurlow, Pa., and the Union Iron Works and Pacific Rolling Mills, of San Francisco, succeeded in meeting the rigid requirements.

In ship and boiler plates Homestead, Linden, Spang, Park and Chester delivered satisfactory material. The first two make protective deck-plates, while the Phœnix Iron Company were particularly successful in furnishing structural material, including Z bars up to 10 inch. Mr. Bernadou mentions specially also the production of corrugated furnaces by the Continental Iron Works.

The fixed policy of the Government has been to steadily increase its requirements so far as the character of the material is concerned, having only temporarily relaxed it in some cases. Mr. Bernadou has arranged the principal points in the specifications in parallel columns, so that the changes from year to year may be readily arrived at. They certainly show remarkable progress. Thus for steel hull-plates and shapes the tensile strength must be at least 60,000 pounds, with an elongation of at least 25 per cent.; for deck-plates the tensile strength must be above 80,000 pounds, with an elongation of at least 18 per cent. in 2 inches, and for steel boiler-plates the longitudinal tests must range between 58,000 and 67,000 pounds, with an elastic limit of at least 32,000 pounds and an elongation of at least 25 per cent. Phosphorus limits have been introduced in some cases where they were not required before; in others the limit has been lowered, going down to 0.03 per cent. in boiler-plates and rivets, and a surplus maximum of 0.04 per cent. has been added for all the material, except castings, for the hulls and machinery of cruisers 7, 8, 9, 10 and 11. It is pretty generally known that the progress indicated by the growing severity of the requirements has been marked by heavy sacrifices in the form of rejections, often apparently unreasonable. It is true that the inspectors in the discharge of their duty must exact literal fulfillment of the specifications, however ready they may be to agree, individually, with the manufacturers that the material is well suited for its purpose. It would be interesting to know, if it could be accomplished without injury to private interests, how much material was condemned.

To the steel trade in general and to consumers of that metal the most significant question with which Mr. Bernadou deals is that relating to the effect of government requirements in bringing about a general improvement in the quality. We quote as follows:

> In answer to inquiries made of private shipbuilders as to the effect upon the steel industries of the recent development of very high grades of metal by the Government, it is acknowledged that the capacity of the plants engaged in the work is improved and the ability to produce high grades of steel increased. It is claimed, however, that the special runs of metal used for government work are generally handled by gangs of especially trained men, and that the government tests have not changed the commercial requirements.
>
> On the other hand, it is recognized that at those establishments where government material is produced the private inspection of the higher grades of steel is now carried on in a manner more nearly in accordance with government methods than those previously obtaining, and it is acknowledged that to the good results of the government system are to be ascribed the constantly increasing improvements and elaborations in private methods.
>
> While there is no positive assurance that the time has yet arrived, yet it is safe to assume that the requirements of steel for bridge, boiler and engine work will soon call for a grade of metal equal to that now used by the Government. No opposition is as bitter and determined as that which is engendered by efforts to avoid the expenditure of large sums of money, and the development of a demand for high grades of steel from conditions where lower grades are now accepted must necessarily be slow.
>
> What the Navy Department can claim is that it has shown to contractors and consumers of the United States what high and excellent grades of steel can be produced in our own country, and that by calling the attention of the nation to those establishments where have been found the skill, ability and inclination sufficient to meet the severe requirements, it has pointed out where the best metal is to be obtained.

We are not inclined to accept these views without some modifications. No one will deny to the Navy Department the credit which is due to it. A very high grade of metal was insisted upon and was paid for. What credit the Department is entitled to is that of pitching its standard high and adhering vigorously to it, in spite of remonstrances and protests. But the simple demand is hardly as laudable as is its fulfillment. The responsibilities of a critical and uncompromising buyer are certainly not to be compared with the anxieties, the labors and the risks incurred by the manufacturer. Let it be granted that the event justified the navy officers who asked for metal which the steel-works did not feel sure that they could make for the price. Still, the credit for the achievements in this direction is certainly due principally to the makers.

The steel industry at large and consumers generally will acknowledge their indebtedness to the Government on these

points. A larger number of producers have learned to make special grades of steel. They can supply it to others than the Government at lower prices, because they have learned better how to make it, and the number of competitors has been increased. Private buyers will reap advantages, too, in the direction of being able to procure, at a lower price, heavy forgings and large plates and structural material. But it is doing injustice to American manufacturers to imply that they oppose improvement because it involves heavy expenditure, and that therefore the development of a demand for high grades of steel from conditions where lower grades are now accepted must be slow. We hold that it is merely a question of price. So long as private buyers of structural material, plates, &c., look more to shaving off $1 per ton than to paying a fair price for a good article, so long they will get their money's worth and no more.

Trying to Check a Boom.

At the present time considerable apprehension is expressed in Western iron circles over the condition of the trade generally. No fear is entertained that prices are in danger of giving way, but, on the contrary, the conservative members of the trade are looking forward to a possible boom, which they are anxious to avert if it can be done. In almost every line of staple products an advance of 15 to 20 per cent. over the lowest prices recently prevailing has been made. This has brought about a buoyant feeling and established such confidence in the recurrence of a period of prosperity that new enterprises of magnitude are being undertaken, which cannot do otherwise than greatly stimulate the consumption of iron and steel. Another advance of one or two dollars per ton in coke pig-iron is deprecated, while a jump of three or four dollars would be regarded as a calamity, taking into consideration the inevitable reaction which would follow. Charcoal pig-iron could be considerably advanced over present prices with safety, and rails are by no means as high as they should be in comparison with the cost of raw materials, but these are almost the sole exceptions. Other iron and steel products are high enough to allow manufacturers reasonable profits, and if profits can be maintained on the basis now established the season of prosperity just begun will last much longer than if very high rates were made and production enormously increased. Prominent Western manufacturers are announcing a new policy of keeping prices down as long as they are able to control them, hoping that they may check the upward tendency and secure stability. How far they can carry this purpose remains to be seen, but their policy is certainly most commendable, and if it is backed by a considerable proportion of the trade it may be successful. At the same time it is admitted that trade movements are often uncontrollable, particularly in this country, and if the consumption of iron and steel should be greatly increased by the improved condition of the railroads the course of prices would be fixed by a much more potent force than the will of a few manufacturers, even though they represent most important producing interests.

THE PARIS EXPOSITION.

French Metallurgical Industry.

The study of any metallurgical exposition does not usually give a fair perspective of the relative importance, the achievements or the standing of the individual exhibitors, or of the country collectively as related to other rival nations. A small concern may assume a place out of all proportion to its true importance by the display of a few feats in work, while its neighbor, with a modest pile of rails or a few samples of pig-iron, may rank among the great concerns of the world. The one may be the product of an antiquated mill stranded long ago by changes in the commercial situation, while the other makes a staple product excellent in quality, though not showy, in enormous quantities, with modern equipment under progressive management. The superficial impressions received at an exposition are dangerous for these and other reasons and should be stated with reserve. Still, on some points deductions are possible and conclusions are warranted. Dealing with the French metallurgical exhibit at the Paris Exposition, the general statement applies which your correspondent made some time since concerning the exposition as an entity. Every visitor is struck by the clever way in which artistic effects are produced by grouping of articles whose clumsiness would apparently defy artistic and pleasing effects. An exceptionally noteworthy instance is the display made along the wall and over the entrance of a side aisle in the great gallery, by Fould-Dupont, of Apremont and Pompey. A number of American iron-masters and engineers commented on it independently, calling the attention of your correspondent to it. Other exhibits possessed the same characteristics in a lesser degree.

To an American the prominence and, we may add, the perfection of war material is a feature in the metallurgical exhibit which attracts immediate attention. Huge armor-plate, great gun forgings, ugly-looking projectiles are noted in every direction. Their size and their number naturally make them the objects of study, especially to Americans, who have heard so much and seen so little of these modern paraphernalia of war. Your correspondent is not ashamed to confess his surprise at the results shown, especially when it is considered that to us the best known of all the great French works, Creuzot, shines by its absence. Your correspondent had the erroneous opinion, possibly shared by many on the other side of the Atlantic, that the establishment named was not alone the one capable of producing the heaviest war material in France, but also that it stood nearly alone in supplying it. One trip through the French section is quite sufficient to dispel that idea, other establishments to which reference will be made in detail being far advanced in the same direction.

It is not the purpose of your correspondent to review the position of the iron and steel trade of France, to forecast its future or to enter upon a description of its natural resources in coal and iron ore. On the whole, nature has not dealt liberally with her, so that the industry of the country has not gone beyond the struggle of maintaining its own home markets for itself.

Roughly, the iron and steel industry may be grouped in four districts—the North, with such works as Anzin, Denain, Marchiennes, Maubeuge, Marquise, Fiveslille; the center, with Creuzot, Commentry, St. Chamond, Firminy, Fourchambault; the South, with La Voulte, Bessèges, St. Louis; and the East, with Longwy, Pont-à-Mousson, Stenay, St. Dizier. Grouping the departments of any importance in these classes, we have the following, placing side by side the production of coal and of iron ore, for which, however, no later data than 1882 are available to your correspondent in France:

Production of Coal and Iron Ore.

	Coal. 1888.	Iron ore. 1882.
North:		
Nord and Pas de Calais	12,364,085	31,000
Center:		
Loire	3,357,817	.....
Saône-et-Loire	1,611,057	146,005
Allier	988,529	.....
Isère	128,700	561,885
Cher	.....	108,530
South:		
Gard	1,827,707	108,079
Aveyron	809,567	42,185
Ardèche	.....	205,787
Ariège	.....	45,120
Pyrénées Orientales	...	145,540
East:		
Meuse	.....	15,540
Meurthe-et-Moselle	.....	2,159,585
Haute-Marne	.....	194,379
Ardennes	.....	6,625
Total production	22,380,813	2,467,251

It will be noted that the Nord, with its enormous production of coal, possesses little native ore. It has access, however, to supplies from Luxembourg and to rich foreign ores. The center, with an ample supply of coal, has near it considerable quantities of ore, drawing, too, from the South, and, like the latter, too, from Spain and Algiers. The East produces an enormous quantity of the cheap minette, which, however, was unfit for steel-making until the basic process was developed. Until then, drawing its coke chiefly from Germany, it was restricted to the manufacture of pig-iron. The revolution which has shifted the iron and steel manufacture of France geographically during the past few years is best illustrated by taking up the principal lines one by one.

OFFICIAL STATISTICS

distribute the make by departments. Arranging them in the four great groups into which the industry is territorially distributed, the North, Center, South and East, we have the following:

Production of Pig-Iron in France.

	1882.	1887.	1888.
North:			
Nord	255,322	223,315	231,693
Pas-de-Calais	53,126	97,920	85,391
Totals	318,448	321,235	317,084
Center:			
Loire	58,547	31,536	34,161
Saône-et-Loire	177,740	55,001	70,107
Allier	90,507	28,151	18,090
Rhône	89,437	8,700	14,368
Cher	17,959	4,590	14,525
Isère	38,763	13,307	13,945
Totals	472,953	141,285	165,196
South:			
Gard	144,818	73,789	54,904
Aveyron	33,388	8,746	6,465
Ardèche	103,316	47,214	47,933
Bouches-du-Rhône	25,739	13,536	21,250
Ariège	22,150	9,632	7,364
Totals	329,411	150,917	128,006
East:			
Meuse	9,767	5,762	3,090
Meurthe-et-Moselle	716,043	770,842	911,009
Haute-Marne	82,865	63,148	43,589
Ardennes	24,258	18,298	20,475
Totals	830,933	858,050	978,163

The total product of the three years was 2,039,000 metric tons in 1882, 1,306,930 tons in 1887 and 1,688,976 tons in 1888, 60,231, 20,886 and 22,792 tons thereof being pig made with charcoal or a mixture of charcoal and coke as fuel. Of the totals named 441,318 tons in 1882, 355,892 tons in 1887 and 382,046 tons in 1888 were foundry iron, the balance being mill iron and pig used ior conversion into steel. A glance at the figures compiled for the different districts shows how high, relatively, is the position of the East, that section which adjoins and participates in the famous minette ore fields of Luxembourg. Its percentage rose from 40.7 in 1882 to 65.6 in 1887 and 58 in 1888.

Grouping in the same way the larger part of the production of puddled iron and products rolled from old material, we have:

Production of Rolled Iron in France.

	1882.	1887.	1888.
North:			
Nord	335,442	285,631	303,541
Pas-de-Calais	308	325	430
Totals	335,750	285,956	303,971
Center:			
Loire	84,280	37,361	37,111
Saône-et-Loire	64,949	68,126	71,564
Allier	38,378	29,360	31,631
Cher	570	560	627
Isère	14,833	5,155	4,009
Nièvre	20,373	5,049	6,672
Totals	223,383	145,611	151,614
South:			
Gard	27,916	14,870	14,103
Aveyron	19,986	11,562	10,200
Bouches-du-Rhône	1,567	880	1,457
Ariège	16,537	6,361	5,331
Totals	76,006	33,373	31,091
East:			
Meuse	20,103	7,993	10,717
Meurthe-et-Moselle	49,111	42,168	42,368
Haute-Marne	90,773	61,657	88,718
Ardennes	79,961	64,290	67,851
Totals	239,948	116,108	209,654
Total product	1,073,021	771,610	833,839

The total production of wrought-iron in 1882 was 1,073,021 metric tons, which declined to 771,610 tons in 1887, rising again to 833,839 tons in 1888. The principal sufferers were again the center of France and the South.

A review of the steel trade will complete the picture and allow of some general deductions:

Production of Steel in France.

	1882.	1887.	1888.
North:			
Nord	61,853	87,664	95,212
Pas-de-Calias	....	61,462	50,985
Totals	61,853	149,126	146,197
Center:			
Loire	132,529	54,536	67,613
Saône-et-Loire	101,320	45,519	48,746
Allier	23,301	11,527	10,360
Isère	8,739	4,321	3,859
Nièvre	5,731	9,897	9,070
Totals	271,620	125,800	139,653
East:			
Meuse	51	5,556	6.155
Meurthe-et-Moselle	1,616	41,265	37,814
Haute-Marne	....	9,160	16,327
Ardennes	171	18,218	21,096
Totals	1,838	74,201	81,392
South:			
Gard	83,579	40,534	34,722
Aveyron	25,803	....	....
Ariège	6,223	4,496	2,087
Totals	115,605	44,030	36,809
Total product	458,238	493,294	525,646

The causes for this decline are not far to seek. The following table, showing the production of steel rails, will go far toward explaining it:

Production of Rails in France.

	1882.	1887.	1888.
North	59,529	114,620	94,863
Center	170,208	4,747	5,098
South	106,461	32,145	23,481
East	.....	25,183	21,818
Landes	.....	26,113	30,313
Total product	336,259	202,900	175,598

The works in the department of Landes, in the Southwest of France, are based on the use of Spanish ores and foreign coke. The figures given show thoroughly how, in the course of a few years, the South and center of France have lost their supremacy in the heavy steel trade in favor of the North, against whom, however, a very formidable competitor is arising in the East. There, in 1882, the first few tons of basic steel were made, and if the course of events in Germany is any criterion to the probable development in France that section will soon assume control in the steel trade, as it does in pig-iron manufacture.

One of the leading authorities in France freely confessed to your correspondent that the days of rail manufacture in the center of France were over, and that in other lines the future did not look promising. He added, however, that if it were only for military reasons the great plants of Creuzot, St. Chamond, Commentry, Firminy and other points in the center of France would not be allowed to follow Terre Noire. His remarks threw a new light upon the situation so far as your correspondent was concerned, and explained to him the prominence in the display at the exposition of war material of nearly every one of the great works in that district. France must have its great gun and armor factories located at a point not easily reached by an invading force. Thus the danger of war props up the failing fortunes of a section threatened by the changes wrought by the introduction of the basic process and the growing independence of great steel plants from the necessity of close proximity to coal-fields.

PERSONAL.

N. A. Didier, for some years connected with the Shenango Warehouse Company, Limited, of Sharon, Pa., has severed his connection with that concern and is now the representative of J. B. Hanquinaux and H. Denayer, builders of tank furnaces for window-glass, Charleroi, Belgium, with his headquarters at Pittsburgh.

Superintendent Porter has appointed Chas. A. Ashburner and John H. Jones special agents to collect the statistics of coal for the eleventh census. Mr. Ashburner, while geologist in charge of the Geological Survey of Pennsylvania, gave personal attention to the location, mining methods and production of the anthracite coal mines of Pennsylvania. Since 1885 he has collected the statistics of the production of coal for the United States Geological Survey. Mr. Jones began his work on coal statistics in 1876 as statistician for the railroad companies engaged in the transportation of anthracite. He has published every year since that time reports on anthracite shipments, which have made him the official authority in regard thereto. Superintendent Porter has also appointed James M. Swank, of Philadelphia, a special agent to collect the statistics of iron and steel throughout the United States for the census of 1890. Mr. Swank held the same position in the tenth census, and his monograph upon iron and steel, as well as his compilation of the statistics of these branches of productive industry, are regarded as models of completeness and accuracy.

Mr. Jos. D. Weeks, editor of the *American Manufacturer and Iron World*, of Pittsburgh, has been appointed a special agent of the Census Office to collect the statistics of petroleum, coke, natural gas and glass for the eleventh census. Mr. Weeks collected the figures for coke and glass for the tenth census and since 1882 has annually reported to the United States Geological Survey on the production of coke, and more recently on natural gas and petroleum.

Capt. Edmund L. Zalinski, Fifth Artillery, now abroad, has been detached for a period of four months to obtain military information, under such instructions of the Secretary of War as may be communicated to him. He will return to the United States and rejoin his proper station upon the completion of these duties.

The many friends of J. C. Brady, secretary of the Wheeling Hinge Company, of Wheeling, W. Va., will be glad to learn that he is able to attend to business after a five-weeks' siege of typhoid fever.

Fr. Stavelius, civil engineer, of Buenos Ayres, is visiting this country for the purpose of studying elevated-railroad systems, with a view to their introduction in his city. He has spent some time also at Phœnixville and Pittsburgh consulting with bridge-builders and manufacturers of structural material. Mr. Stavelius believes the people of the United States are blind to their own interests in doing so little to cultivate trade relations with the Argentine Republic, but looks forward to important results following the congress of the three Americas which is to be held in Washington this fall.

Francis F. R. Brown has resigned the position of Mechanical Superintendent of the Canadian Pacific to become superintendent of the Dominion Bridge Company, Montreal.

An inventory of the estate of the late Charlemagne Tower, the mining operator of Pennsylvania, places the total valuation at over $20,000,000.

Louis E. Rechtin, of the Cordesman Machine Company, of Cincinnati, was in Chicago last week visiting machinery dealers and users of wood-working machinery. He reports an excellent trade in the past six months, plenty of orders on hand and a very bright prospect for the balance of the year.

W. H. Pratt, C.E., recently resigned his position with the Edge Moor Bridge Works to become superintendent of the Mount Vernon Bridge Company's works, at Mount Vernon, Ohio.

Charles F. Farrar, son of Canon Farrar, of England, will take a course in scientific subjects at Lehigh University, and will then go to the Rensselaer Polytechnic Institute, of Troy, N. Y., to get the degree of civil engineer.

Lieut.-Com. T. A. Lyons has been ordered to this city as a member of the Naval Board of Inspection of Merchant Vessels, of which Capt. Henry Erben is president.

Judge Wheelock G. Veazey, of Vermont, is appointed to succeed Judge Walker, of the Interstate Commerce Commission. Next to Judge Walker he is said to be the ablest of the five men originally named to compose that body.

Wm. L. Brown, of Pickands, Brown & Co., pig-iron commission merchants, of Chicago, has gone to the Yellowstone Park with his family for a few weeks' recreation. He may extend his trip to the Pacific Coast. The firm have just finished the heaviest six-months' business in their history and Mr. Brown's vacation is well earned.

Among the injured in the accident on the Knoxville, Cumberland Gap and Louisville Railroad was A. A. Arthur, general manager of the Middlesborough Town Company Pending his recovery the affairs of the company will be under the general control of C. M. Woodbury, vice-president, of Knoxville, Tenn., and John M. Brooks, resident manager, at Middlesborough, Ky.

Press dispatches report that M. P. Janney, superintendent of the Glendon Iron Company, at Easton, Pa., has tendered his resignation.

Horace See, president of the American Society of Mechanical Engineers, on July 25 placed his resignation in the hands of Cramp & Sons, the ship-builders, whose chief designer of machinery he was. Mr. See sailed on September 4 in the City of Paris, in which he will return on October 16, after visiting the Paris Exposition and a number of foreign ship-yards. Mr. See will locate then in New York as consulting engineer and naval architect. In this connection his services have already been secured by the Chesapeake Dry Dock and Construction Company and the Morgan Steamship Line.

Prof. James E. Denton, of Stevens Institute, Hoboken, N. J., has been elected one of the vice-presidents of the American Society for the Advancement of Science.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, September 2, 1889.

Pig-Iron.—Some large blocks of Charcoal Iron were sold during the week and manufacturers of this class of Iron are consequently growing more independent. It would be difficult to find any No. 1 Lake Superior Charcoal available at less than $19, cash. On a few brands the higher numbers are still to be had at $18.50, cash, and even less where water delivery can be made. In the present favorable condition of the market for sellers this opportunity to secure cheap Charcoal Iron cannot last long, as no advance has yet been made commensurate with the advance on Coke Iron. The demand for the latter has been fair and sales have been limited only by the scarcity of Iron. The movement was specially heavy in No. 3 Iron, and the price of that grade has further advanced. Ohio Blackband is in very good demand and the advance made is being sustained. Furnace men are reporting trouble in securing cars to ship Iron to customers, who are clamoring not only for prompt shipments but for the anticipation of contracts. The advance in the price of Coke at the ovens and the upward movement in railroad freights from Ohio furnaces are expected to have a decided effect on prices of Coke Pig-Iron here very shortly. Quotations are as follows, cash, f.o.b. Chicago: Bessemer, $17.50; Lake Superior Charcoal, $18.50 @ $19; Local Coke, No. 1, $16.50; No. 2, $15.50 @ $16; No. 3, $15; Chicago and Bay View Scotch, No. 1, $16.50; American Scotch (Blackband), No. 1, $18.50 @ $19; Jackson County, No. 1, $17.25 @ $18; Hocking Valley and Hanging Rock Silvery, No. 1, $17 @ $17.50; Southern Coke, No. 1, $16.50; No. 2, $15.50; No. 3, $15; No. 1, Soft, $15.75; No. 2, Soft, $14.75; Gray Forge, $14.50; Mottled, $14; Tennessee Charcoal, No. 1, $17.75; Alabama Car-Wheel, $24 @ $25.

Bar-Iron.—Several large orders have been taken during the week, one of 1000 tons going to an Ohio mill, while a local mill secured a nice contract for 500 tons. An excellent inquiry is reported from jobbers, manufacturing consumers and car-builders. The prospects of the latter are constantly brightening, and they will need a great deal of material before the close of the year. An advance of 4¢ per 100 lb is to be made in freights from the Mahoning Valley and Pittsburgh on the 13th inst., and this will probably be added to prices, which are at present about 1.70¢ for Common and 1.80¢ for Single Refined for mill lots, f.o.b. Chicago. Orders for Car-Iron have been taken at 1.67½¢, flat, deliverable at shops near Chicago, but the sellers have refused to book more at the same price. Jobbers quote store prices at 1.75¢ for Common as a strictly bottom price, ranging to 1.85¢ for usual orders, with 1.85¢ @ 1.90¢ for Single Refined.

Structural Iron.—Vierling, McDowell & Co. have secured the contract for the Iron-work of the large Leiter Building, which is the most important structure recently undertaken. Architectural foundries are busy on city and outside work, but claim that their capacity is by no means covered and that the results of the year's business are not satisfactory. Quotations are as follows, f.o.b. Chicago: Angles, 2.25¢ @ 2.35¢; Universal Plates, 2.30¢ @ 2.40¢; Sheared Plates, 2.35¢ @ 2.40¢; Tees, 2.60¢; Beams and Channels, 2.90¢. From stock on hand: Angles, 2.40¢; Tees, 2.65¢ @ 2.70¢; Beams and Channels, 3.40¢

Plates, Tubes, &c.—The demand is good, large inquiries constantly coming up which cannot be filled except at a material advance in prices. The mills are very independent and are putting out no options. Mill lots of Nos. 10 to 14 Iron Sheets are quoted at 2.40¢ @ 2.50¢ at mill, Steel Sheets at 2.50¢ and Iron and Steel Tank-Plate at 2.25¢ @ 2.35¢. Orders can be filled from store at the following rates: Iron Sheets, Nos. 10 to 14, 2.70¢; Steel, Nos. 10 to 14, 2.75¢ @ 2.80¢; Tank, Steel and Iron, 2.50¢ @ 2.60¢; Steel Plates, Shell, 3¢; Flange, 3.50¢; Fire-Box, 4.25¢; Otis, 5.50¢; Ulster Iron, 3.75¢; Boiler-Rivets, 4¢ @ 4.25¢; Boiler-Tubes, 52½ % discount on 1¾-inch and less and 57½ % discount on 2-inch and larger.

Sheet-Iron.—The demand is excellent and prices are stiffening Mill lots are quoted on a basis of 3.05¢ @ 3.10¢, at mill, for No. 27 Common, with freight rates also advancing. The bottom price of No. 27 from store is 3.30¢, with 3.40¢ named for ordinary buyers, and the usual difference on heavier gauges.

Galvanized Iron.—Large inquiries are in the market, and manufacturers are at last undertaking to advance prices. Leading brands have been advanced to 67½ % and 2 % to best buyers. The demand from store is very fair, with small lots quoted at 65 % @ 65 % and 5 %.

Merchant Steel.—Large transactions are promised in the near future, as some of the leading agricultural buyers who have been persistently holding off have at length decided to place their season contracts. Manufacturers are still quoting as follows, f.o.b. Chicago: Soft Steel Bars, 1.90¢ @ 2¢; Spring and Tire Steel, 2.25¢; Toe Calk, 2.30¢ @ 2.40¢; Open-Hearth Machinery, 2.75¢; Bessemer Machinery, 2.10¢ @ 2.15¢. From store jobbers quote: Mild Machinery, 2 10¢ @ 2.20¢; Tool, 7.75¢ @ 8.50¢; Bessemer Machinery, 2.40¢ @ 2.60¢; Open-Hearth Machinery, 3¢; Sheet, 7¢ @ 10¢; Tire, 2.30¢.

Steel Rails.—The market is strong, but no large orders have been placed since our last report. Negotiations for winter deliveries of considerable quantities are pending, but sellers thus far refuse to name a price for deliveries extending into next year. Standard sections are now quoted at $32 @ $32.50, and 30-lb to 35-lb are held at $35. Some orders for Western roads have recently gone to Eastern mills on account of the inability of the local mills to make the desired deliveries. About 6000 tons were so placed, at prices equivalent to about $32.50, Chicago.

Track Supplies.—Several good orders for Splice-Bars, &c., were placed during the week. One of the largest was a contract for fastenings for 80 miles of road. Makers quote as follows, f.o.b. Chicago: Steel Splice-Bars, 1.90¢ @ 1.95¢; Iron Splice-Bars, 1.80¢ @ 1.85¢; Spikes, 1.95¢ @ 2¢; Bolts, Square Nuts, 2.50¢ @ 2.55¢; Hexagon, 2.60¢ @ 2.65¢.

Old Rails and Wheels.—The Old Rail spurt of last summer is repeating itself. Sales of Iron Rails have been made at $24.25, $24.50 and $24.75, and railroads are now asking still higher figures. As this market is now relatively higher than Youngstown or Pittsburgh prices will have to advance at those points before another upward movement is secured here. Old Steel Rails are quiet, with long pieces quoted at $18 and short lengths at $15. Old Car-Wheels are also quiet, with leading dealers quoting them at $18, while others value them at $18.75 @ $19.

Scrap-Iron.—While business in this line could easily be more active without causing much excitement, the week has witnessed a fair number of transactions. Mill Iron has been moving freely and is now much scarcer than it was; a considerable business has also been done in Splice-Bars, and Cast-Iron is now well cleaned up, but Forge Iron is plentiful and somewhat neglected. Consumers of the latter, however, are apprehensive and seek to place options with dealers, so as to protect themselves against a sudden advance. Quotations are as follows ℔ net ton: No. 1 Forge, $18.50 @ $19; No. 1 Mill, $14 @ $14.50; Splice-Bars, $20.50; No. 2 Mill, $9 @ $9.50; Car-Axles, $23.50 @ $24; Horseshoes, $18.50; Wrought Turnings, $11.50; Axle Turnings, $13; Wrought Pipe, $13 50; Locomotive Tires, $16.25; Leaf Steel, $15.25; Coil Steel, $14.50; Cast Machinery, $12; Stove-Plates, $9; Cast Borings, $8.25; Mixed Country Scrap, $15.

Hardware.—Business in Shelf Goods continues very active, the most important feature of the past week having been the receipt of large orders for assorted stocks from the Hardware houses of Spokane Falls, recently burned out. Apart from that, the average volume of business has been high from all sections tributary to this market. As crop prospects are improving every day, the outlook for fall trade is most promising. Carriage and Heavy Hardware are in good demand, and seasoned Wagon-Stock is scarce. Coil-Chains have been advanced from $2 to $3 ℔ ton by the manufacturers.

Nails.—The price of Cut Steel Nails has been advanced 5¢ ℔ keg by jobbers, who now quote $1.95 for any quantity less than carloads. The quotation on carloads at Chicago is $1.90 and at factory 10¢ less, with free sales. Very favorable specifications can, of course, be placed lower. Further advances are expected, because of the upward movement in freights, while the increased cost of raw materials is by no means covered by the price at which Nails are now being sold. Wire Nails are not so firm as Cut Nails, being quoted at $2.35 from store, $2.30 in carload lots at Chicago and 10¢ less at the factory.

Barb-Wire.—Small quantities are called for with sufficient frequency to make the volume of business quite satisfactory, but carload orders are scarce as yet. Prices continue unchanged at 2.75¢ for Painted and 3.35¢ for Galvanized in small lots.

Pig-Lead.—Dealers report a quiet week, with quotations ranging from 3 70¢ to 3.80¢ for spot and 3.75¢ to 3.80¢ for futures. Sellers are holding off to see what the developments will be, and hoping for an improvement.

Jones & Laughlins, Limited, have been obliged to make an important addition to the office space of their Chicago branch in order to accommodate an increased force of clerks, which has been rendered necessary by the growing business of this house under the management of J. M. Larimer.

Philadelphia.

Office of *The Iron Age*, 230 South Fourth St., PHILADELPHIA, Pa., September 3, 1889.

Without any special change in prices the market during the week has fully maintained its strength, with some indications of a further advance as soon as buyers begin to place orders again. Weakness is not to be found in any department, although some are stronger than others, and prices, if not actually higher, come very near being so, and probably will be so in course of a few days' time. The prominently strong articles are the best brands of Pig-Iron, also Spiegel and Bessemer, and Finished Iron and Steel in all its various forms. Sales have not been of unusual magnitude during the past few days, the disposition being to wait and see what position sellers will assume after the slight pause which the market has experienced. Consumption is the main thing, however, and so long as that is kept up on the present enormous scale sellers

are not likely to care very much whether contracts are renewed now or two or three weeks later, as they have the strongest kind of evidence that buyers will be ready quite as soon as sellers are. There is already a great deal of inquiry, and Bars have been advanced to 2¢ from store, everything else being proportionately strong.

Pig-Iron.—There is a good deal of inquiry for Pig-Iron, but there has not been sufficient business to cause any change in prices. Large buyers hesitate to pay current rates unless their stocks really need replenishment, but those who must buy have no alternative but to comply with sellers' demands. The chances are that as soon as the heavy buyers have taken in their lines prices of small lots will be marked up; meanwhile sales are being made at about $15.25 @ $15.50 for Gray Forge, delivered; $16.50 @ $17 for No. 2 and $17.50 @ $18 for No. 1. One or two lots of 1000 tons each and upward have been secured at prices fractionally lower than above quotations, but they have very little bearing on the general market, in proof of which may be mentioned the fact that two or three leading brands are so far sold up that orders are not being taken unless at an advance of 50¢ ℔ ton, and business is not solicited at any price. The actual position is, therefore, of a most promising character—no accumulation of stock and no difficulty in selling all the Iron that can be spared over and above what contracts call for. Buying is likely to be on a large scale during the next two or three weeks, as a great many contracts are running out and will have to be renewed at some price, probably higher than those quoted in this article. Sales to-day have been at full-quoted rates, viz., $18, delivered, for No. 1 and $15.50 for Gray Forge.

Blooms.—The market is strong, and orders for prompt delivery hard to place. Quotations are irregular, but a fair average of the market would be about as follows: $29.50 @ $30, delivered, for Nail Slabs; $32 @ $33 for Tank Slabs; $36 50 @ $37 for Shell Slabs; $39 @ $40 for Flange, and $41 @ $43 for Fire-Box; Charcoal Blooms, $52 @ $54; Run-out Anthracite, $42.50 @ $43; Scrap Blooms, $32.50 @ $33.50 ℔ "Bloom" ton of 2464 lb

Muck-Bars.—The market is unsettled and prices more than usually irregular. Some quote $29 at mill, others have nothing to offer below $30, but there are very few Bars for sale, so that it would not require much to give them another start. Latest sales were at $29.50, delivered, which may be considered an inside figure for good neutral Bars.

Bar-Iron.—There is a heavy demand for Bars, and prices are still tending upward. Store prices have been advanced to 2¢, and there are very few manufacturers willing to sell at less than 1.85¢ @ 1.90¢, at mill. The difficulty is to get deliveries in time to suit buyers' requirements, and when it comes to such deliveries as manufacturers can meet, prices become the chief obstacle to business. Cost is advancing so rapidly that it becomes a serious question whether present selling prices will be sufficient to compensate manufacturers two or three months later on. At all events, sales are not urged, the disposition being to keep within moderate limits, as all the indications point to a very active market during the fall and winter months.

Skelp-Iron.—There is a great amount of business waiting acceptance at about 1.85¢ for Grooved and 2.10¢ @ 2.15¢ for Sheared. Some sales have been made at 1.85¢, others at 1.90¢, with a tendency on the part of sellers to ask still higher figures.

Plates.—Active and firm. It is difficult to give exact quotations, as some mills are not in a position to accept business and others require to see what the specifications are before committing themselves. The tendency is toward higher figures, however, so that a price named to-day may be withdrawn to-morrow. Ordinarily the following are fair average prices for such lots as can be furnished within 30 days: 2.15¢ @ 2.25¢, delivered, for Ordinary Plates and Tank Plates; 2.25¢ @ 2.30¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.25¢; Fire-Box, 3.7¢ @ 4¢; Steel Plates, Tank and Ship Plate, 2.23¢ @ 2.35¢; Shell, 2.6¢ @ 2.7¢; Flange, 2¾¢ @ 3¢; Fire-Box, 3½¢ @ 4¢.

Structural Material.—There is an unusually good general demand; the chief difficulty is to be able to furnish the material as soon as required. Prices are higher on Plates and Angles, and may be quoted about as follows: Bridge Plate, 2.20¢ @ 2.30¢, delivered; Angles, 2.15¢ @ 2.25¢; Tees, 2.6¢ @ 2.7¢; Beams and Channels, 2.8¢ for Iron or Steel, all delivered at Philadelphia or its equivalent.

Sheet-Iron.—The market is active and firm. Inquiries are more numerous and mills are running to their full capacity. Prices are easily maintained, the increase in cost of production making it impossible to grant concessions. Carload lots are quoted as follows:

Best Refined, Nos. 14 to 20	3¢
Best Refined, Nos. 21 to 24	3.20¢
Best Refined, Nos. 25 to 26	3.40¢
Best Refined, No. 27	3.50¢
Best Refined No. 28	3.60¢
Common, ¼¢ less than the above.	
Best Soft Steel, Nos. 14 to 20	3¼¢
Best Soft Steel, Nos. 21 to 24	3½¢
Best Soft Steel, Nos. 25 to 26	3¾¢
Best Soft Steel, No. 27	4¢
Best Bloom Sheets, ¼¢ extra over the above prices.	
Best Bloom, Galvanized, discount	65 %
Common, discount	67½ %

Steel Rails.—It is difficult to get the real facts in regard to prices. There is no question as to the improved demand, but while sellers quote $29 @ $30 firm, buyers claim they can do nearly a dollar better. Sellers in this vicinity are quoting $30, and it is hardly likely that they would go below $29, no matter how desirable the order.

Old Rails.—Business is exceedingly slow, owing to the meager supply of Rails. About $24.50 @ $25, delivered, seems to be the extreme limit for buyers, while sellers ask about the same figures for spot lots at whatever point they may chance to be.

Scrap-Iron.—The scarcity of supplies is given as a reason for the comparative dullness, but prices do not advance, as might be expected. They are firm, however, and sales are easily made at last week's prices, say: $21 @ $21.50 for cargo lots; $21.50 @ $22 for carload lots, delivered; or for choice, $22.50; No. 2 do., $15 @ $16; Turnings, $14 @ $15; Old Steel Rails, $16.50 @ $17.50; Cast Scrap, $15 @ $16; do. Borings, $9 @ $10; Old Fish-Plates, $23 @ $24.

Wrought-Iron Pipe.—The demand is satisfactory and business very heavy. Mills are full of orders and prices firm at last week's discounts. Butt-Welded Black, 50 %; Lap-Welded Black, 62½ %; Butt-Welded Galvanized, 42½ %; Lap-Welded Galvanized, 50 %; Boiler-Tubes, 52½ % @ 57½ %, according to size.

Nails.—Moderately active, but no change in prices. Stocks are low and production somewhat restricted, but carloads are still available at $1.85 @ $1.90, and lots from store about $2.

The Reading Iron Company, of Reading, Pa., have opened their sales office at 417 Walnut street, Philadelphia, and appointed Samuel D. Hopkins sales agent.

Mr. Francis Wister has removed his offices to the Bullitt Building, and continues as before making Coke, Coal and Ores his leading specialties.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, September 2, 1889.

Pig-Iron.—There has been no change of note in the general condition of the market, the stacks that are desirous of getting rid of all their output are doing so without any trouble, and there are those that would rather hold their product, or at least a portion of it, as the impression appears to prevail that prices will advance some in the not-far-off future. There seems to be a feeling among a good many that the troubles in England will not be confined to their present position, but will soon extend into all the different branches of the industries of that country, including the Iron and Coal workers. Rates of freight have been modified a little to some points North and West, and to a very few some advance has been made. The pressure for cars is beginning to be felt, as many consumers are manifesting a desire to get their purchases into their yards as soon as possible. Altogether the market shows a strong and healthy condition.

(*By Telegraph.*)

Pig-Iron rates to the North and Northwest will be advanced after September 16 about 25 cents from Chattanooga and Birmingham, Ala.

St. Louis.

Office of *The Iron Age*, 214 N. Sixth st., St. Louis, September 2, 1889.

Pig-Iron.—The past week has been moderately quiet, and the few transactions closed were mostly for small lots for immediate use. There were only one or two sales for future shipment, and these were taken at figures at least 25¢ above the market. In some instances furnaces refused to quote unless for immediate shipment. Consumption is on the increase, and there is plenty of work in view in all lines of industry. The Architectural Ironworks are running day and night, and have enough work on hand and in sight to keep them comfortably employed well into the winter months. Car works and Pipe mills are also running full, and it is expected will soon place some heavy orders. There is some difficulty in placing Iron at the advanced figures, and several large concerns have been holding off, looking for lower prices, but so far the furnaces have refused to shade the figures as quoted herewith, and the deals have consequently held fire. What the outcome will be it is hard to determine, but at the moment the seller has everything in his favor, and if the contracts are not closed shortly it is quite probable more money can be had for the Iron later on, as furnaces are disposed to advance prices just as soon as the demand warrants them in so doing. For ordinary-sized lots we quote as follows, for cash, f. o. b. St. Louis:

Southern Coke, No. 1 Foundry,	$15.75 @	$16.00
Southern Coke, No. 2 Foundry,	14.75 @	15.50
Southern Coke, No. 3 Foundry,	14.50 @	14.75
Gray Forge	14.00 @	14.25
Ohio Softeners	17.00 @	19.00
Lake Superior Charcoal	20.00 @	21.50
Missouri.		
Charcoal Foundry, No. 1	16.25 @	16.50
Charcoal Foundry, No. 2	15.00 @	15.50
Tennessee.		
Charcoal Foundry, No. 1	17.50 @	18 00
Charcoal Foundry, No. 2	17.00 @	17.50

Connellsville Coke, f.o.b. East St. Louis, $4.85; St. Louis, $5.

Bar-Iron.—There is no perceptible change to note in this department. Demand is heavy and prices are firm, and it is probable an advance will soon be in order. For the present we quote as follows: Lots from mill at from 1.70¢ to 1.75¢; small lots from store at from 1.80¢ to 1.85¢.

Barb-Wire.—There is a heavy demand from jobbers and country dealers and mills are running to their full capacity. The old complaint in regard to prices is still prevalent, but with the advance in rods it seems almost impossible for Barbed Wire to continue as at present quoted, which, the mills claim, just about clears expenses, and they confidently expect to be in a position shortly to advance the present prices. Jobbers now quote as follows: From 2.75¢ to 2.85¢ for Painted, and from 3.35¢ to 3.45¢ for Galvanized; carload lots at from 2.65¢ to 2.70¢ for Painted and 3.25¢ to 3.30¢ for Galvanized, f.o.b. St. Louis.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave., PITTSBURGH, September 3, 1889.

While possibly the general Iron and Steel situation is not as excited as it was a week ago, there is no falling off in the volume of business, which never in this district exceeded that of the present time. All the mills and furnaces, not only here but in the Shenango and Mahoning valleys, are as busy as they can be, and most of them have sufficient contracts to absorb their product during the remainder of the present year. Not only is there a very large volume of business, but it is legitimate and healthy. As noted in our last report, there is an entire absence of speculation. Those of a speculative turn have let the golden opportunity pass and there is not much probability of their investing now when there is a possibility of the highest notch having been reached. Therefore, unless something unforseen at present turns up, an active, healthy business in both Iron and Steel for some time to come is assured. Reports not only from the West, but the South as well, are of a most important character in regard to general business; and we are getting large orders from those sections for all kinds of manufactured goods. In regard to Southern Pig-Iron, there has been little heard or said about it here during the past week, and it is probable that the owners and makers have discovered that they can do better with it at points nearer home, where it has little or no competition, is better known and the cost of transportation is not so much. A gentleman from Memphis, formerly a resident of Pittsburgh, who is now here on a visit, says that the outlook in the South for business of all kinds is exceedingly encouraging and that at Memphis there is a regular boom. The purchase of the river Coal interests, which include the Coal lands, mines, steamboats, barges, and landings of all our river Coal operators, by Eastern capitalists, is still in negotiation and bids fair to go through. The capitalists are represented by W. P. Shiner, of New York, and it is said that it will require some $15,000,000 to $18,000,000. The great water-way convention which meets at Cincinnati to-morrow will be the most important convention of the kind that ever met in this country. Pittsburgh will be largely represented. The great object is river improvement.

Pig-Iron.—We have to report a continued active and strong market, and during the week under review there has been a further advance established in prices. Forge Irons advanced more than any other kind, but Foundry Irons have also commenced to move more freely, and prices are tending upward. The sales of Bessemer Iron continue large, some 25,000 to 30,000 tons having been reported during the week, and the market is strong at last week's prices. The feeling still obtains that the price of Coke will be advanced still more, and if so the price of Pig-Iron will sympathize. This to same extent accounts for the anxiety of consumers generally to anticipate future wants, which they are doing to the best of their ability; many of them have covered for the next 60 days and some of them until the 1st of January. As compared with the lowest point, Mill Iron has advanced $2 ℔ ton and Bessemer about $2.50. The sales in this market during the past two months have been unprecedented; never before were so many large blocks reported—5000, 10,000 and even 15,000 ton lots, and all these represent the actual stuff and will be delivered according to contract. It is expected that there will be a considerably improved demand for Foundry Irons during the next week or two. We quote as follows:

Gray Forge Neutral	$15.50 @	$15.75,	cash
All-Ore Mill	16.25 @	16.50,	"
White and Mottled	14.00 @	14.50,	"
No. 1 Foundry	17.00 @	17.50,	"
No. 2 Foundry	16.00 @	16.50,	"
No. 3 Foundry	15.00 @	15.50,	"
No. 2 Charcoal Foundry	21.00 @	22.00,	"
Cold Blast Charcoal	25.00 @	28.00,	"
Bessemer Pig	17.75 @	18.00,	"

It is reported that a sale of 3000 tons of Bessemer was made by a valley furnace to go to Cleveland, at $18.25, cash.

Muck-Bar.—The reports are conflicting; while sales have been reported at $28.50 @ $28.75, we hear of offers to sell at $28 and even $27.75. It appears that there was quite an accumulation of the article and thus far there has not been anything like the demand for it that there has been for Pig-Iron, and the feeling obtains that there is an effort being made in some direction to break the market.

Manufactured Iron.—There is a continued good demand; mills are all fully employed and likely to be until the close of the present year. Prices continue firm, in sympathy with the raw material. We quote Bars at 1.75¢ @ 1.80¢; Plates, 2.15¢ @ 2.30¢; No. 24 Sheet, 2.85¢ @ 2.90¢, all 60 days, 2 % off for cash. Skelp-Iron continues in demand and prices are still tending upward; Grooved quotable at 1.80¢, @ 1.85¢, and Sheared at 2 10¢ @ 2.20¢.

Nails.—Cut Nails are firm here at $1.90, 60 days, 2 % off for cash, but it is still claimed that they are being sold for less in the Wheeling district.

Wire Nails.—The card remains unchanged at $2.25, 60 days, 2 % off for cash, and it is said that the market is a little firmer, although the card is still being cut slightly.

Wrought-Iron Pipe.—There is no abatement in the demand for Pipe; the mills are all pressed with business, many of them unable to catch up with their orders. Prices, while unchanged, are very firm at the combination rates. Discounts on Black Butt-Welded Pipe, 50 % ; on Galvanized do., 42½ % ; on Black Lap-Welded do., 62½ % ; on Galvanized do., 50 % : Boiler-Tubes, 1¾ inch and smaller, 52½ % ; 2-inch and larger, 57½ % ; Casing, 5⅝-inch, 60 %. The September meeting of the association will be held in this city on the 13th inst., at which it is expected prices will be advanced.

Old Rails.—The offerings of Old Iron Rails continue light and the market is in such a peculiar condition that it is difficult to give reliable quotations. There was a small sale reported at $25.75, yet there has been but little business above $25, while as the same time they cannot be laid down here from sources either East or West under $26.50 @ $27. Chicago is asking $24.50 @ $25 there. Old Steel Rails are in better demand and firmer; sales reported at $19 for short and $20.50 for long lengths.

Billets, Blooms, &c.—There is still a good demand for Bessemer Steel Billets, and mills are all oversold. Some of them are unable to catch up with their contracts, and are in no hurry about booking new orders. Prices are firm at $29 @ $29.50. Rail Crops in the absence of sales may be quoted at $19.50 @ $20 and Bloom Ends at $19.

Steel Rails—Are firmer and higher; we now quote heavy sections for delivery between now and January 1 next at $30, cash, on cars at works. Contracts for winter delivery might be taken below the price quoted. But few mills are in position to take additional orders for delivery this year, as they are sold out.

Railway-Track Supplies.—There is no change to note in prices. Spikes, 2.10¢, 30 days, on cars at works in Pittsburgh, although one firm report that it is difficult to get over 2¢. Splice Bars are still quoted at 1.75¢ @ 1.85¢ and Track Bolts at 2.75¢ @ 2.85¢.

Old Material—Is in better demand and firmer. No. 1 Wrought Scrap quoted at $20 @ $20.50 ℔ net ton; Wrought Turnings, $13.50 @ $14; Car-Axles, $24.50 @ $25; Cast Scrap, $15, gross; Cast Borings, $12 @ $12.50; Old Car-Wheels, $18 @ $18.50.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, September 2, 1889.

Pig-Iron.—Uniform reports of an active business, a confident feeling and higher prices have been received from the various local factors and agents, mills and foundries respecting the past week. Large sales as well as small ones have been readily effected, and Foundry Iron as well as Forge has been taken both for prompt shipment and future delivery at full prices. It has been demonstrated to the satisfaction of many that the increase in the consumptive demand has been at a greater ratio than the increase in production and with all the new stacks in sight as well as old ones repaired, the future is bright for a further advance in the prices of Iron. There is some question if the advance obtained during the past week on Iron was an increase of intrinsic worth, or simply an adjustment of prices in conformity with the advance in freight rates. The advance obtained on Iron has varied from 25¢ to 50¢ ℔ ton. The advance on freight rates to Ohio River points has been about 15¢, and north of the Ohio River another advance of about 15¢. It is claimed, however, that all purchases of Iron made prior to September 16 will be "protected;" that seems to mean, that all Iron, no matter what the delivery, sold before the 16th inst. will be delivered at the old transportation rate. This explanation accounts for the increase in the demand, and also leaves the impression that the advance in prices has been an actual enhancement. Car-Wheel Iron, both of Northern and Southern make, has sold less readily, and has not advanced with other grades. Pennsylvania and Virginia Iron has met a much more active demand and several 1000-ton lots have been sold at the range of values previously quoted. The aggregate sales made during the week are in the neighborhood of 30,000 tons, for delivery extending through the next seven months. Among them were 3000 tons No. 3 Southern Foundry at $14, for October, November and December delivery; 2000 tons ditto at $14, prompt shipment, and smaller amounts at $14.25, cash basis; 4000 tons Gray Forge at $13.50; 2500 do. at same rate, and Mottled in

moderate amounts at $12.80 @ $13, spot. No. 1 Southern Foundry has sold at $15 @ $15.50, and No. 2 do. at $14 50 in a few hundred ton lots. Southern Car-Wheel Iron sold in lots of 100 to 500 tons and less to the extent of 1500 tons at $23.50, cash, and Lake Superior Iron on a basis of $19.75, cash, here. The following are approximate prices current here at the close for cash, f.o.b.:

Foundry.	
Southern Coke, No. 1	$15.25 @ $15.50
Southern Coke, No. 2	14.50 @ 14.75
Southern Coke, No. 3	14.00 @ 14.25
Ohio Soft Stone Coal, No. 1	16.00 @ 16.50
Ohio Soft Stone Coal, No. 2	15.00 @ 15.50
Mahoning and Shenango Valley	16.00 @ 16.50
Hanging Rock Charcoal, No. 1	20.00 @ 22.00
Hanging Rock Charcoal, No. 2	19.00 @ 21.50
Tennessee and Alabama Charcoal, No. 1	17.50 @ 18.50
Tennessee and Alabama Charcoal, No. 2	16.50 @ 17.50
Forge.	
Gray Forge	@ 13.50
Mottled Neutral Coke	12.75 @ 13.00
Car-Wheel and Malleable Irons.	
Southern Car-Wheel	23.00 @ 23.50
Hanging Rock, Cold Blast	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable	19.75 @ 20.25

Manufactured Iron.—There has been quite an active demand for Bar, Sheet, Plate and Galvanized Iron, and a firm tone has prevailed, without essential change in prices.

Nails.—There has been a fair jobbing demand and a firm market. Iron and Steel Nails, 12d to 40d, sell at $1.85 @ $1.90 ℔ keg, with 10¢ rebate in carload lots, at the mills. Steel Wire Nails sell at $2.40 for 60d.

Old Material.—There has been quite an active demand for Old Rails, and a firm tone has prevailed; sales were made early in the week at $23.50 @ $24; at the close $25 is reported bid. Old Wheels have been reported sold at $17.50, but this is probably an ancient sale, as $18.50 @ $19 is said to be bid, spot cash.

Detroit.

WILLIAM F. JARVIS & Co., under date of September 2, 1889, say: All rumors to the contrary notwithstanding, the Lake Superior Charcoal Iron market is stronger to-day than it has been at any period during the present year. The rumors mentioned refer to reports that have gained some credence that while other grades of metal have shown definite advances, the Lake Superior Charcoal Iron market has not only not developed these advances generally, but has even become weaker. There is considerable disparagement in the price of Lake Superior Iron, owing almost entirely to the situation of the various furnaces. For instance, there are four large furnaces in Michigan and Wisconsin which depend almost entirely upon the season of navigation on the lakes for the movement of their output. In addition to this there are three others who depend largely upon it. As these furnaces make nearly as much Iron as all of the other active furnaces put together at such points as Chicago and Lake Erie ports, they can practically control the market. Iron can be carried, and is carried, as cheaply from Lake Superior ports to Buffalo, for Eastern consumption, as it is from Detroit to Buffalo, less than one-third the distance. Hence it can readily be seen that if Buffalo is the point at which a market price is to be based, Detroit, for the same market, would be exactly what the cost of freight from Detroit to Buffalo is at a disadvantage. Then add to this disadvantage the extra cost of Ore at Detroit, and the furnaces in this section would be just so much further set back. But this position is not maintained during the entire year, for the furnaces depending upon navigation for the delivery of their metal, once that it closes, are forced to accumulate about a six-months' supply at each furnace, which adds, of course, to the interest account quite seriously. In other words, the "navigation" furnaces have the advantage during the summer months and the "railroad" furnaces a nearly equal advantage during the winter months. But it is nevertheless a fact that the largest volume of consumers take advantage of navigation deliveries, for the bulk of their entire purchases and contracts during the present year have been made for delivery or payments as long as 12 months ahead. The reason for the advance in Iron during the past two weeks is that the "navigation" furnaces are entirely sold up, and any further lots of Iron to be purchased must be taken from the "railroad" furnaces. A straight advance of $1 ℔ ton above the lowest prices of the year has been obtained, not only for small lots, but for round lots We know of no Iron to-day that can be purchased, in the Eastern market, for instance, where it has to be moved, at anything under this advance. It may be inferred from the above that during such a weak market as we have had the freight advantage of the "navigation" furnaces has been frequently given to or in some cases divided with purchasers, and when the market is the same at all points, namely, Chicago, Detroit, Cleveland and Buffalo, the manufacturer at Detroit who depends upon moving his Iron to one of these points other than his own local market finds it difficult to do so and make it pay. The late advance will greatly help those who have accumulated any stocks. Ohio Irons have been advanced, roughly, $1 ℔ ton, owing to the demand and the increased cost of Coke. Southern Irons are very scarce, and we think it is a good indication that, with the enormous increase in business in this country and a larger output than ever of Pig-Iron, a short supply is developing and the surplus being largely taken up. The market is fairly quotable to-day as follows:

Lake Superior Charcoal, all numbers	$19.25 @ $19.75
Lake Superior Coke, all ore	18.50 @ 19.50
Lake Superior Coke, cinder mixed	17.50 @ 18.50
Standard Ohio Black Band	18.00 @ 18.50
Southern No. 1	17.00 @ 17.50
Southern Gray Forge	15.50 @ 16 00
Southern Silvery	16.50 @ 17.00
Jackson County (Ohio) Silvery	18.00 @ 18.50
Old Wheels	18.00 @ 19.00

William F. Jarvis & Co., of Detroit, Mich., have taken the exclusive sale of the entire output of the Katahdin Charcoal Iron Company, of Bangor, Maine. The new line of the Canadian Pacific road reaches this furnace and gives it an advantageous outlet for the Western market. William F. Jarvis & Co. will also represent it where it is already well known, viz., in the Eastern market.

New York.

Office of *The Iron Age*, 66 and 68 Duane street,
NEW YORK, September 4, 1889.

American Pig.—Sales have not been heavy, but negotiations are pending for quite a number of round lots. Some efforts are being made to get more money for the higher grades, the Southern furnaces particularly endeavoring to hold out for higher figures. We cannot learn, however, that any business of consequence has yet been done. Southern freights are to be advanced 25¢ in a short time, so that higher prices will naturally follow. Quotations are as follows: No. 1 Anthracite Foundry, at tide-water, $17 @ $18; No. 2, $16 @ $17; Gray Forge, $15 @ $15.75; Southern No. 1 Coke Foundry, delivered at New York, $16.75 @ $17; No. 2, $15.25 @ $15.50; No 3, $15 @ $15.25.

Scotch Pig.—Quotations remain nominally at $20 @ $20.50 for Eglinton; Dalmellington, $20.25 @ $20.50; Summerlee, $22.25 @ $22.50, and Langloan, $22 @ $22.50.

Spiegeleisen and Ferromanganese.—The only transaction of any magnitude has been the purchase by an Eastern rail mill of about 3000 tons of 20 % Spiegel, early delivery, at private terms. Ferro is inquired for and is stiffer. We quote 20 % Spiegel $29.75 @ $30 and Ferromanganese $61.50 @ $62 for 80 %.

Finished Iron and Steel.—The tendency is upward. Inquiries for Plates, Bars and Structural Material are quite numerous. We note one sale of 1000 tons of Ship-Plates, at private terms, an advance of one-tenth of 1¢ being claimed. We quote as follows, on dock: Sheared Plates, 2.15¢; Universal Mill Plates, 2.20¢ @ 2.25¢; Angles, for the smaller sizes, 2¢ @ 2.10¢; for larger sizes, 2.25¢; Tees, 2.4¢ @ 2.6¢; Beams and Channels, 2.8¢. In Plates, Steel Tank is 2.3¢ @ 2.35¢ for ¼ inch or thicker and 2.45¢ @ 2.5¢ for thinner; Shell, 2.55¢ @ 2.6¢; Flange, 2.75¢ @ 2.8¢; Marine Steel, 2.8¢ @ 2.85¢; Fire-Box, 3.25¢ @ 3.75¢. For Bars we quote: Common, 1.6¢ @ 1.65¢, Medium, 1.65¢ @ 1.7¢, and Refined, 1.8¢ @ 2¢. Hoops, 2¢ @ 2.1¢; Galvanized Sheets, 65 % and 5 %.

Merchant Steel.—The market is quiet, with Machinery at 2.10¢ @ 2.15¢; Tire, 2.15¢ @ 2.20¢; Toe-Calk, 2.30¢ @ 2.35¢. The price on Sleigh Shoe has not been made. It is probable that it will open at 1.9¢.

Steel Rails.—The market is steady and quiet. The only sales reported are a small lot delivered at Hudson at $29.35, 3000 tons to Eastern Pennsylvania and 5000 tons, September delivery, to go to the West, all by Eastern mills. We quote $28 @ $28.50, at mill.

Old Rails.—The situation has not changed except that buyers are gradually creeping up with their bids, while holders' views advance in proportion. There have been no transactions, so far as we can learn, to fix value. A small spot lot is offered equivalent to $24, Jersey City, and 600 to 700 tons at sound ports could be purchased at about $24.50, delivered at the same point. Holders ask $25 and upward for the small stock of foreign Tees, and $26 @ $27 for foreign Doubles.

Track Material.—Manufacturers are trying to get better prices, withdrawing offers and asking 1.85¢ @ 1.9¢ for Angles and $1.95 @ $2 for Spikes.

Financial.

The intervention of Labor Day makes a short business week. Nevertheless the volume of transactions makes a liberal aggregate, and all indications point to a prosperous trade through the autumn season. The single drawback is the prevailing lower tendency of prices for leading commodities, and the narrow margin of profits realized in nearly all branches of trade. Wheat is irregular, but crop prospects are not less promising, and European advices strengthen the belief that the entire American surplus will find a market at prices fairly remunerative. A well-known English statistician places the requirements of Great Britain and Ireland from outside sources at 147,000,000 bushels, and *Bradstreet's* estimate for the whole of Europe is 230,000,000 bushels, or 44,000,000 bushels more than last year. Corn declined ¼¢. Provisions advanced. Depression in the anthracite coal trade, the producers hope, will be rectified by limiting the output for September to 3,000,000 tons, or 916,000 tons less than for the corresponding month last year. Respecting the Monongahela coal combine with $25,000,000 capital, a Pittsburgh

paper remarks that "the scheme may be a profitable one for the negotiation of trust certificates" should it fully materialize. The much-heralded Boston leather trust proves to be mythical. The New York dry goods jobbing market maintains a steady position. The tone of both cotton and woolen goods continues strong. The grocery trade is a little disappointing. Teas are in a bad position and raw sugars weakened, foreign advices being unfavorable. Coffee is more active and higher. The effects of the great London strike are scarcely apparent, except in the delay of steamers from the other side. Orders filled in London are "subject to shipment." The agreement of the Central Traffic Association to advance rates on iron September 16th reflects improvement in an important industry.

The stock market, influenced by liberal bond purchases, easier money and favorable crop advices, steadily advanced. The announcement was made that Mr. Manvel had been selected to succeed Mr. Strong as president of the Atchison, Topeka and Santa Fé, and this had a stimulating effect upon that stock. On Saturday it was made known that Mr. Shaw, president of the Hocking Valley, had resigned, and thereupon that stock rose sharply. The market was strong at the close on Saturday. On Tuesday the bull element was in the ascendant and T. B. Musgrove, of Musgrove & Co., was a victim. He sold the market "short," and also sold privileges freely, chiefly calls, and these are the principal cause of his failure, with $100,000 liabilities. A rise in Northern Pacific preferred was caused mainly by the continued purchases of brokers for Mr. Henry Villard.

United States bonds are quoted as follows:

U. S. 4½s, 1891, registered	105¾
U. S. 4½s, 1891, coupon	105¾
U. S. 4s, 1907, registered	127
U. S. 4s, 1907, coupon	127
U. S. currency 6s	118

The weekly bank statement showed an increase of $2,468,975 in surplus reserve, which now stands at $6,427,000. The banks gained heavily through the purchase of bonds, but the effect of Government disbursements will not be fully apparent before another week. In loans there was a contraction of $6,247,000. Deposits showed a decrease of $3,394,700. Specie increased $1,687,500. The sudden increase of bond offerings was the only new feature in the financial situation, aside from the consequent decline in the rates for money. Since August 20 the payments on account of bond purchases reach no less than $22,500,000, dispelling all immediate prospect of financial stringency. Rates on call fell from 2 to 6 %; time loans were more freely offered at 4½ % on dividend and 5 on good mixed collateral for 30 to 60 days, and at 5 on dividend and 5½ on good mixed for four months. Buyers of commercial paper renewed their inquiries for choice names, and some of our city banks bought with comparative freedom. The September disbursements will be larger than they were last year, and this distribution of money will add to the volume of loanable funds.

The public debt statement just issued shows an increase of the debt within the month amounting to $6,076,692, and within the first two months of the fiscal year, $7,094,403. Last year the debt was decreased in August $7,324,676, and during the two months it was decreased $11,461,974. The total debt, less cash in the Treasury, is now $1,083,740,625. The interest-bearing debt is made up of $131,695,600 of 4½ % bonds, due in 1991, and $663,141,000 of 4 % bonds, due in 1907. The increase in the debt has come about this year in spite of an increase of over $500,000 in the receipts since July 1. The surplus in the Treasury is now $43,489,909, against $65,857,090 a month ago and $107,673,320 August 31, 1888. The gold coin and bullion in the Treasury is $304,048,189—an increase of $3,288,417 during the month. The standard silver dollars and bullion reach an aggregate par value of $287,843,466, which is a small increase.

The market for sterling was dull. Posted rates closed at $4.84½ for 60 days and $4.88½ for demand. The Bank of England rate was advanced to 4 %. The London *Economist* says that the conditions favor a further advance in American railroads It foresees large American crops, an expansion of trade and an abundance of traffic, giving no occasion for a reduction of rates. If rates are maintained, it says, American railroads will be sure to have a prosperous half-year. There was a considerable advance in the price of silver last week. London quotation, 42½d per ounce; New York, 92½¢.

Business failures during the week numbered 211, as compared with 226 for the same time last year. Lewis & Brothers, of Philadelphia, offer 62½¢ on the dollar.

Exports of merchandise from this port for the week were valued at $7,876,000, comprising 500,000 bushels of wheat, 364,000 bushels of corn, 15,000 bales of cotton and 7,900,000 pounds cut meats. Since January 1 the total is $230,307,600, against $194,490,700 for the same time in 1888. Imports for the week amounted to $10,426,000, making a total since January 1 of $340,817,000, as compared with $317,372,000 for the same time in 1888. Exports of specie were $746,000.

Metal Market.

Copper.—Spot Copper improved since our last report from £43. 7/6 in the London market to £43. 10/ last night, futures on the other hand giving way from £42. 5/ to £42, sales aggregating 350 tons in the meantime. Our own market has remained apathetic and featureless on the basis to consumers of 12¢ for Lake, 11½¢ Montana and Arizona, and 10½¢ casting brands. The visible supply in England and France on the 1st instant is shown to have been 106,070 tons, against 107,980 on August 16, 108,110 on August 1 and 86,670 on September 1, 1888. The deliveries were 13,400 tons in August, against 13,300 in July and 3300 in August, 1888.

Tin.—London declined with spot Tin from £91. 5/ to £91. 2/6; for futures the market receded from £92 to £91. 12/6, with total sales for the week not exceeding 180 tons. The New York market displayed increased activity; 10 tons were sold on the spot at 20.45¢; 20 tons September at 20.45¢; November being done at 20.20¢. The closing price of spot Tin is 20½¢. The visible supply in Europe and America on the 1st inst. was 13,302 tons, as compared with 12,750 on August 1 and 12,140 tons on September 1, 1888. *Tin-Plates.*—The market here is firmer, being more in sympathy with better advices from abroad, and less so on account of an improved demand here. Makers report their order-books full for three or four months ahead. As it is known that most of those orders are for account of dealers here who have to market their goods, we are not as firm as we otherwise should be. We quote large lines, ordinary brands, ₱ box: Siemens-Martin Steel, Charcoal finish, $4.75 @ $5.50; Coke finish, $4.60 @ $4.65; Ternes, $4.12 @ $4.30; Coke Tins, $4.30 @ $4.40, and Wasters $4.12½ @ $4.15. Seven months' shipments from England to the United States were 203,219 tons, against 167,882 in 1888 and 156,738 in 1887, out of a total respectively of 256,317, 225,016 and 207,435.

Lead—Some 500 tons have been sold on the spot at rising prices, beginning with 3.95¢ and ending with 4.05¢. At the close the market remains very strong at 4¢ @ 4.05¢. There is very little to be had even at the latter two figures.

Spelter—Has quieted down somewhat with less doing, the quotation being 5.10¢ @ 5.15¢ for Common Domestic. Silesian, having advanced to $22. 7/6 in London, cannot now be laid down in New York for less than 6½¢, at which it is nominally held.

Antimony.—Now that prices have risen so much consumers buy the strictly requisite and no more, the quotation at the close being 18½¢ @ 19¢ for Cookson's and 17¢ Hallett's.

New York Metal Exchange.

The following sales are reported:

THURSDAY, September 3.

16 tons Lead, October ..... 3.95¢

WEDNESDAY, September 4.

10 tons spot Tin ..... 20.50¢

Coal Market.

The expansion of the Anthracite Coal trade usual at this season is yet to come. The resolve of the companies a week ago to limit the September output to 3,000,000 tons is expected to stimulate tardy buyers, but the amount of current orders indicates no marked change in the situation as yet. The reported production for the week ending August 31 is 766,000 tons, making the total since January 1 22,247,000 tons, a decrease of 1,371,000 tons compared with the same time in 1888. Notwithstanding efforts to restrict, the Reading, New Jersey Central and Lehigh Valley are in market, each with an average of more than 300,000 tons in excess since the beginning of the year. The official report for July showed that the stock of Coal on hand at tide-water points decreased 45,695 tons to 788,069 tons, indicating that the consumption for the month was 3,673,000 tons. The following comparison of prices of domestic sizes of Coal at the mines, August, 1888 and 1889, is interesting at the present time:

	1888.	1889.
Stove	$2.75	$2.40 @ $2.50
Egg	2.50	2.15 @ 2.25
Chestnut	2.50	2.15 @ 2.25

The comparison is more favorable to the present year than the figures show, since in 1888 circular rates at this period of the season were pretty strictly adhered to by both the larger roads and the individual operators, while this year cutting of prices has been the rule.

Quotations are: Broken Free Burning, f.o.b., $3.90; Egg and Chestnut, $4.15; Stove, $4.40.

Bituminous Coal stands at the pool figure, $3.25, f.o.b., subject to discount. Cumberland reports 67,000 tons; Clearfield, 71,000 tons; Pocahontas, 44,734; Beech Creek, 34,717 tons.

Bids for 2000 tons of coal for the use of the Police Department were as follows: William D. Bruns, $4.30; Samuel G. French, $4.32, and George W. Winant, the present contractor, $4.08 a ton.

The Reading Railroad Company are reported to be negotiating with the Lehigh Valley Railroad Company for a share of the latter's prospective new traffic from the Schuylkill County Coal fields. If the traffic is conceded, the Reading will not build a projected new line into that territory to checkmate the Schuylkill and Lehigh Railroad.

The operators of the Connellsville Coke region agreed upon prices for Coke to prevail after September 1. To furnace men the price will be $1.35 ₱ ton; to dealers, $1 50, and to foundry men, $1.65. These are the prices on cars at the ovens.

The statistics of the Industrial Bureau of Pennsylvania for 1888 show that the aggregate earnings of the 710 Bituminous

Coal miners in 71 collieries who are classed as the most skilled, representing those who earned the largest amounts in such collieries, were $394,077.81, or $465.27 per man. The aggregate earnings of the 450 Anthracite miners in 45 collieries who are classed as the most skillful, representing those who earned the largest amounts in such collieries, were $330,327.80, or $734.06 per man. The average daily earnings of the former class were $1.96, and the average days each miner worked was 230.70. The average daily earnings of the Anthracite Coal miners were $2.98 per man, and the average number of days each miner worked was 246.17.

Imports.

Hardware, Machinery, &c.

Auffmordt, C. A. & Co., Mach'y, cs., 6
Boker, Hermann & Co., Mdse., cs., 24; Arms, cs., 30
Coombs, Crosby & Eddy, Pumps, cs., 5
Curley, J. & Bro., Cutlery, cs., 2
Corbiere, Fellows & Co., Mach'y, pkgs., 7
Danis, Turner & Co., Guns, cs., 2
Degrauw, Aymar & Co., Mdse., cs., 11
Field, Alfred & Co., Mdse., cs., 8
Folsom, H. & D. Arms Co., Arms, cs., 4
Godfrey Charles J. Arms Co., Arms, cs., 22
Hartley & Graham, Arms, cs., 30
Klam, J. J., Mach'y, cs., 2
Lau, J. H. & Co. Arms, cs., 16
Lewis Bros. & Co., Mach'y, cse., 1
Louiza, W., Mach'y, boxes, 14; Cane Mills, 10
Merchants Despatch Co., Hdw., pkgs., 3; Guns, cs., 3; Mach'y, cs., 4
Meacham Arms Co., Arms, cs. 9
Rotterdam S. S. Co., Arms, cs., 15
Safety Car Heating Co., Mdse., cs., 30
Schoverling, Daly & Gales, Mdse., cs., 18; Arms, cs., 17
Seth Thomas Clock Co., Mdse., cs., 59
Thebaud Bros., Mach'y, cs., 23
Taintor, G. E., Guns, boxes, 2
Werlemann, H., Arms, cs., 19
Western Union Telegraph Co., Tools, pkgs., 5
Wiebusch & Hilger, Lim., Hdw., cse., 1; Anvils, 180
Witte, John G. & Brother, Cutlery, cs., 7

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, September 4, 1889.

The Copper market has been quiet during the week. Scarcity of cash warrants restricted operations to some extent and the lack of confidence in prices being maintained is also a drawback to speculation. The general belief is that the support of the market depends chiefly upon the patience of French holders. It is the fact, however, that while Chili Copper and Merchant-Bars are dealt in very cautiously, the demand for the refined sorts continues good, and that the mining companies are realizing full prices for their produce. Furnace material continues noticeably strong. Among other transactions, sales are reported of 500 tons Anaconda Matte at 8/6, and 100 tons Montana Matte at 8/4½, to arrive, in Liverpool. Copper deliveries in Liverpool during August exceeded those of any previous month, and while the new supply has been the largest received since July, 1888, the total visible supply has decreased no less than 1922 tons since August 1st.

"Bulls" on Block-Tin have been realizing to some extent, meanwhile giving a measure of support to the market. The dock strikes have a restraining influence upon business for consumption, and few sales have been made. The Batavia sales of Billiton realized a parity of £91. 5/ in Holland.

There has been large buying of Tin-Plate and considerable desire to book for forward delivery has also been manifested. Makers are not inclined to accept the prices offered. Several firms have raised their quotations and others have temporarily withdrawn from the market. All works are very busy on orders.

The Pig-Iron market has continued strong and the position remains very favorable to sellers. The returns of stocks on hand show a marked decrease and consumption seems to be steadily increasing. There is, however, only a moderate business for American account. The Summerlee Furnace at Brante has been sold out. There is talk of lighting more furnaces in Scotland. Some furnaces are being damped on the East Coast. In Scotch Pig, the most important change is 3/ advance asked for Coltness, other brands being only a fraction higher than last week. Middlesborough Pig, Hematites and Spiegeleisen are unchanged. Manufactured Iron of all descriptions continues in good demand at firm prices, as do also Steel Rails, Billets, Blooms and Ship-building sorts. There has been quite a brisk demand for Old Material and the market is strong. The strikes interfere with the business of shippers.

The Wear Rolling Mills, at Hartlepool, will shortly be restarted.

Scotch Pig.—There is a very active business and prices are strong and generally higher.

No. 1 Coltness,	f.o.b.	Glasgow	64/
No. 1 Summerlee,	"	"	60/
No. 1 Gartsherrie,	"	"	60/3
No. 1 Langloan,	"	"	59/6
No. 1 Carnbroe,	"	"	51/
No. 1 Shotts,	"	at Leith	59/6
No. 1 Glengarnock,	"	Ardrossan	56/6
No. 1 Dalmellington,	"	"	50/6
No. 1 Eglinton,	"	"	48/6

Steamer freights, Glasgow to New York, 4/: Liverpool to New York, 10/.

Cleveland Pig.—The market very firm and business fairly active. No. 3 Middlesborough quoted 43/9 @ 44/, prompt.

Bessemer Pig.—Demand continues good and the market strong. West Coast brands, mixed numbers, 55/ @ 55/6, f.o.b. shipping point.

Spiegeleisen.—There is still a good business at firm prices. English 20 % quoted 82/6, f.o.b. at N. W. England shipping point.

Steel Rails.—Business still active and the market strong. Heavy sections quoted at £5 and light sections £5. 5/ @ £6, f.o.b. at N. W. England shipping point.

Steel Blooms.—There has been more doing and prices are firm. We quote £4. 7/6 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—In these there is yet a fairly active trade at full prices. Bessemer, 2½ x 2½ inch, £4. 12/6, f.o.b. at N. W. England shipping point.

Steel Slabs.—Very little demand and prices unchanged. Bessemer, £4. 15/, f.o.b. at N. W. England shipping point.

Old Rails.—Quite a good demand, but buyers and sellers still apart. Tees quoted at £3. 7/6 @ £3. 10/, and Double Heads £3. 12/6 @ £3. 15/, c.i.f., New York.

Scrap-Iron.—The demand moderate, but prices firm. Heavy Wrought quoted £2. 5/ @ £2. 7/6, f.o.b.

Tin-Plate.—Buyers and sellers apart, restricting business. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	15/3 @ 15/6
IC Bessemer Steel, Coke finish	13/6 @ 14/
IC Siemens " " "	13/9 @ 14/3
IC Coke, B. V. grade	@ 13/3
Charcoal Terne, Dean grade	12/ @ 12/6

Lead.—A moderate business at steady prices. Quoted £12. 12/6 for Soft Spanish.

Crop Ends.—Less demand this week, but sellers firm. Bessemer quoted £2. 15/ @ £2. 17/6, f.o.b.

Manufactured Iron.—There is still a good business and the market continues strong. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Marked Bars				@	8	10	0
" Common "				@	6	17	6
Staff. Bl'k Sheet, singles				@	8	15	0
Welsh Bars (f.o.b. Wales)	6	12	6	@	6	15	0

Copper.—Good purchases for consumption, speculation slow. Merchant-Bars quoted at £43. 5/, spot, and £42 three months' futures. Best Selected, £48.

Tin.—The market less active than last week and prices easier. Straits quoted at £90. 15/, spot, and £92 for three months' futures.

Spelter.—The market continues strong. Quoted at £22. 2/6 for ordinary Silesian.

Foreign Markets.

EQUIVALENTS

	Cents.
Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Milreis (Portugal)	$1.08.
Milreis (Brazil)	54.6
Mark (Germany)	23.8
	Pounds
Kilogram	2.205
Picul	134.

BRAZIL.

PARA, August 27, 1889.—*India Rubber.*—Two firms of this city bought all the available stock of Rubber, causing an advance being asked for any fresh supplies due.—*Per cable direct*

CHILI.

VALPARAISO, July 5, 1889.—*Copper.*—Sales for the fortnight were restricted to 6909 quintals at $15.90 @ $16.40, equaling, cost and freight, per steamer, £39. 16/3. *Coal*—Has remained steady at 39/ @ 40/ for Newcastle on the spot, and later afloats at 37/6, while Australian is weak at 26/. There are no buyers of Furnace Coal. *Exchange*—Has dropped to 25⅛d @ 25⅛d for 90 days' sight on London.—*Weber & Co.*

EAST INDIES.

MANILA, August 26, 1889.—*Hemp*—Is firm at $13.62½ ₱ picul, against $10.25 same date last year, equaling ₱ ton, cost and freight, £43. 15/, against £33. 15/ There have been no clearances for the United States, against 3000 bales in 1888; since January 1, 144,000, against 102,000; loading for ditto, 18,000, against 35,000; cleared for England since January 1, 176,000 bales, against 240,000; loading for ditto, 33,000, against none; cleared for all other ports, 30,000, against 47,000; receipts at all ports since last cable, 10,000, against 18,000; since January 1, 386,000 bales, against 335,000 in 1888 and 317,000 in 1887. *Freight.*—$5, against $6. *Exchange.*—Six months' sight on London, 3/5¾, against 3/5.—*Ker & Co., per cable direct to their agent in New York, Mr. Charles Nordhaus, 89 Water street.*

PENANG, July 18, 1889.—*Tin.*—The fortnight's receipts reached 11,000 piculs, of which Europeans purchased 5300 and Chinese 5500, the latter partially for shipment to China and in part on speculation. The market receded from $33.37 to $33, in order to wind up at $33.60, after touching $33.85. Speculators hold from 3000 to 4000 piculs.—*Schmidt, Kustermann & Co.*

SINGAPORE, July 24, 1889.—*Tin.*—Since the 9th inst. there has been a slight increase in the supply, and a moderate business has been done at, throughout, pretty nearly to equivalent of current value in London; as we close, however, there is a decidedly firmer feeling, and the market closes very strong at $33.80 ₱ picul, without sellers. *Tonnage.*—Rates for dead-weight to London have risen from 25/ to 30/. *New York via Cape.*—The Mariner, Carrie L. Tyler and Annie Stafford fill the berth. *For Boston.*—No vessel has so far been circulated to follow the Mystic Belle. *Exchange* gave way to 3/2.—*Gilfillan, Wood & Co.*

COLOMBO, July 18, 1889.—*Plumbago*—Has continued in good request and scarce. We quote at the close in rupees, ₱ ton: Large lumps, 145 @ 170; ordinary ditto, 125 @ 160; Chips, 80 @ 95, and Dust, 40 @ 65. Shipments have been distributed since October 1 as follows: To England, 129,032; to Venice, 102; to Hamburg, 7419; to Antwerp, 12,439; to Bremen, 1254; to Holland, 437; to India, 139;

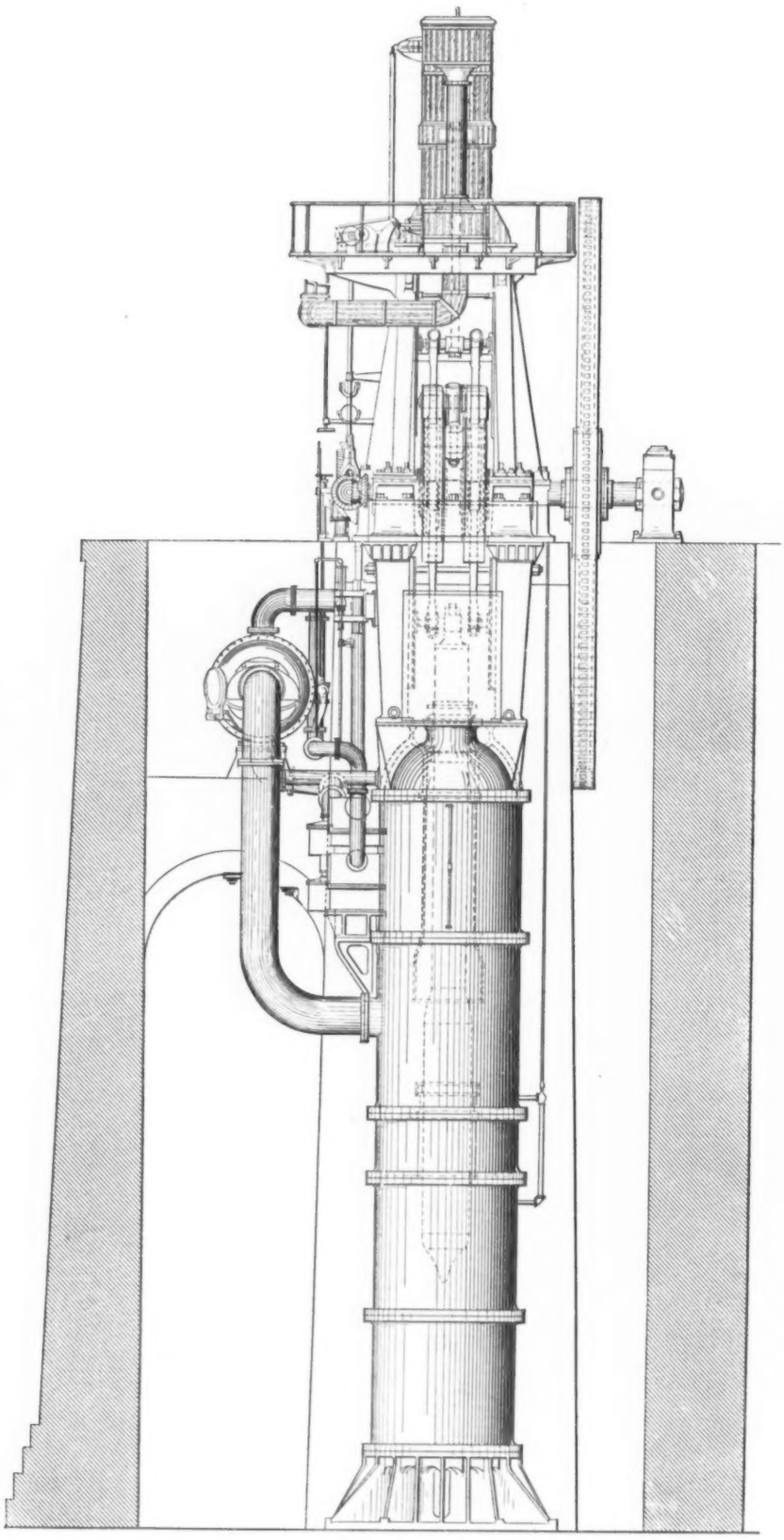


FIG. 1.—END ELEVATION.

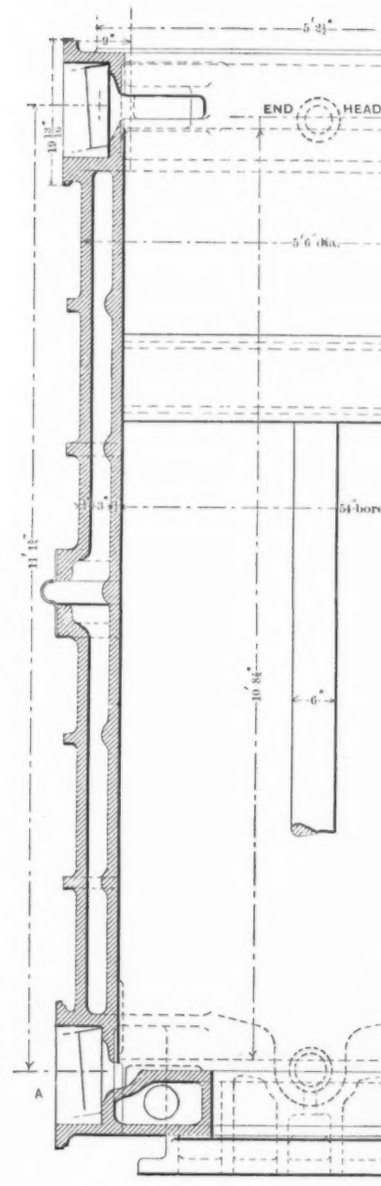


FIG. 4.—LOW-PRESSURE CYLINDER, SHOWI

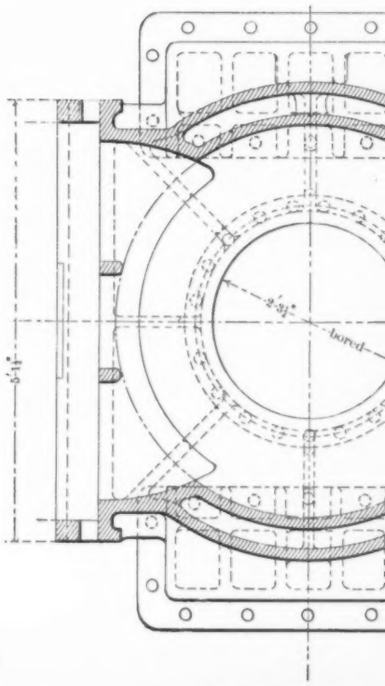
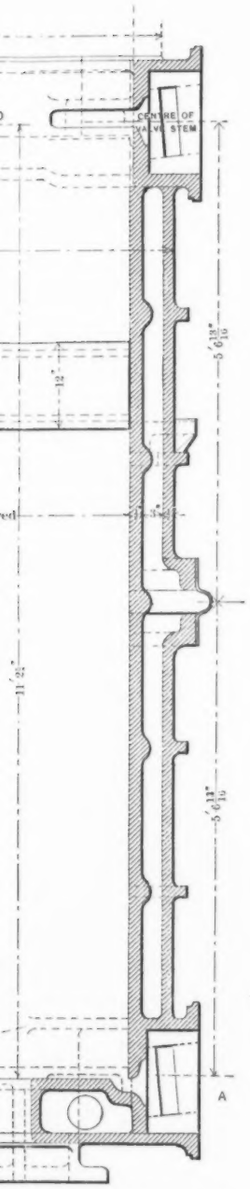
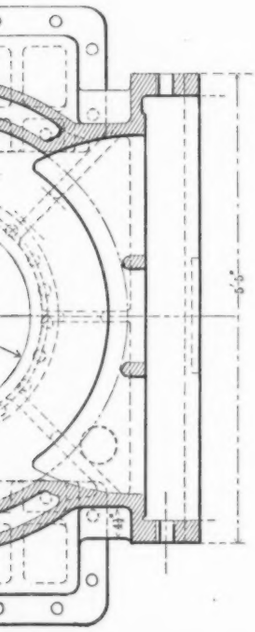


FIG. 5.—SECTION N

PUMPING ENGINE FOR LOUISVILL



ING METHOD OF JACKETING.



N A A.

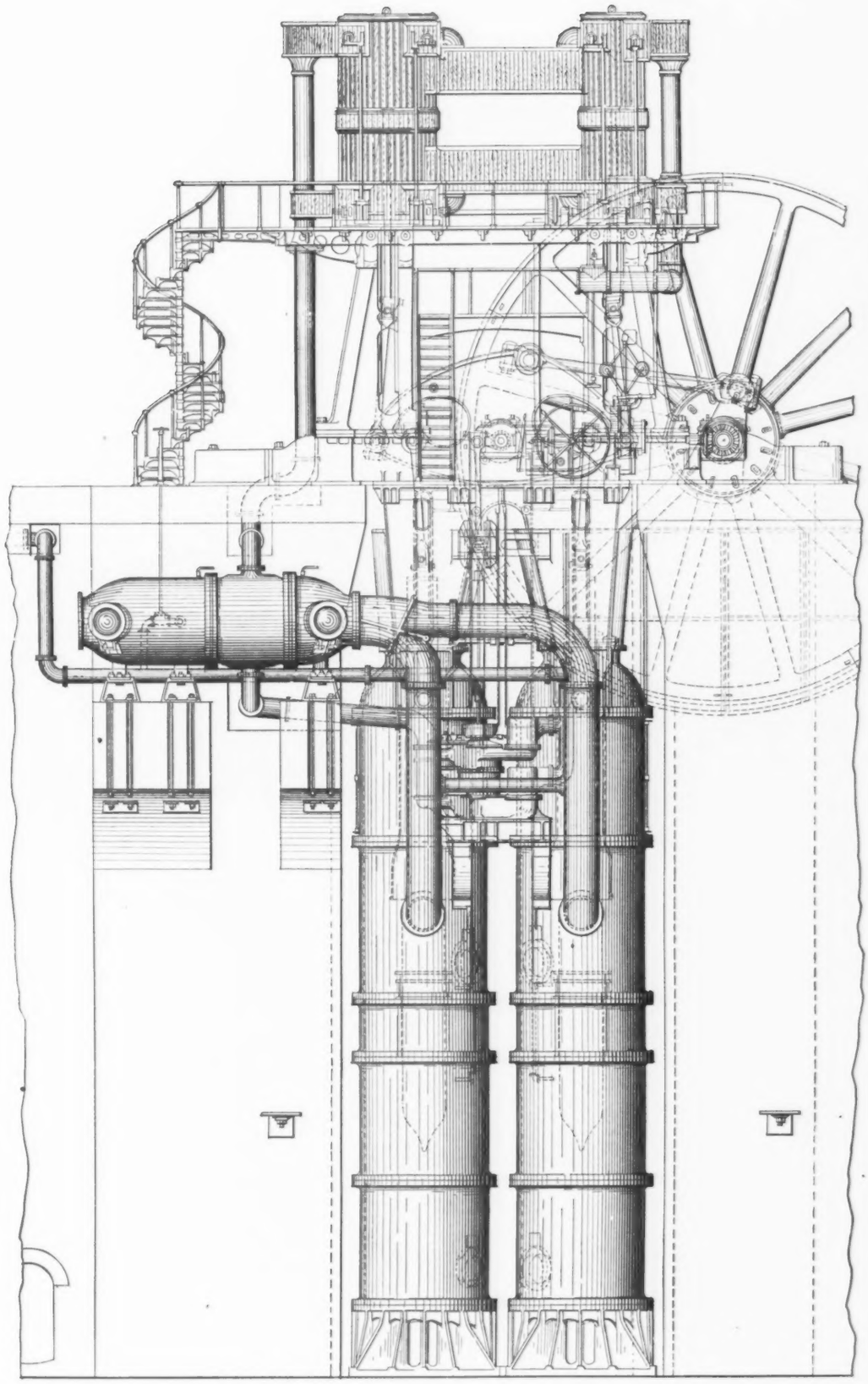


FIG. 2.—SIDE ELEVATION.

LE WATER COMPANY, LOUISVILLE, KY.

to Australia, 392, and to the United States, 126,435; together, 277,649, against last year 204,437; in 1887, 183,339, and in 1886, 145,341. *Exchange.*—Six months' sight 1/4½.—*Volkart Bros., Ceylon and Malabar Coast, through their agent in New York, Mr. John W. Greene, 82 Wall street*

BELGIUM.

BRUSSELS, August 24, 1889.—*Iron.*—The trade in Finished Iron has been hampered, as makers cannot go on selling at the old rates, all raw material and labor having again risen. No. 2 Merchant has been slow at 13 francs ₹ 100 kg., free on board at Antwerp. Pig-Iron is scarce and dearer for delivery during the first half of next year; the quotation for Forge Pig is 5 @ 5.50 francs ₹ kg.—*Moniteur des Intérêts Matériels.*

GERMANY.

HAMBURG, August 24, 1889.—*Iron.*—The Rhenish-Westphalian market remains firmly sustained, nor is there any fear of its caving in for some time to come in view of the stiff fuel prices. Some of the blast-furnaces sold ahead all they can turn out for the remainder of the year; they are securing Coke for the first quarter of 1890. Coke continues scarce. Contracts are being made for forward delivery of Pig-Iron at 3 marks advance on current figures. The stock of Spiegel is reduced to a minimum; it remains firm at 70 marks for 10 to 12 %. Both Forge and Foundry Pig-Iron are as active and stiff as before, the former at 47 @ 64 and the latter at 62 @ 68; White Steel, ditto, 63 @ 64; German Bessemer, 58 @ 59, and Thomas, 52 @ 53. All sorts of finished are in lively request and tending upward. The Wire branch forms an exception and is still under a cloud. Foundries, machine-shops and railroad material makers are all remuneratively engaged. Bessemer Steel Rails, 130 @ 135. German railroads are ordering more material.—*Borsenhalle.*

SPAIN

BILBAO, August 10, 1889.—*Iron Ore.*—The demand for available cargoes has been active at 8/3 @ 8/6 for Campanil and 7/1 @ 7/4 for Rubios Superior. Single cargoes of Rubio Avenado have been taken at 7/3, and at the same figure a larger contract for forward delivery has been made. A demand is springing up for delivery next year. Vessels are scarce, causing light shipments. Since January 1 they reached 2,424,045 tons, against 2,303,372 last year and 2,772,905 in 1887. *Pig-Iron*—Has improved notably. Week's coastwise shipments were 460 tons, and to Italy, 1650 tons.—*Bilbao Maritimo y Comercial.*

Large Coke Transactions.

Last week announcement was made in Pittsburgh that the H. C. Frick Coke Company, of that city, had acquired by purchase exclusive control of the coke plants of the J. W. Moore Coke Company and J. M. Schoonmaker Coke Company, both located in the famous Connellsville region. The first-named plant is small, consisting of 379 ovens located in Westmoreland County. In addition to the ovens there is also a large tract of valuable coal land, which was included in the sale. The purchase of the Schoonmaker plant came in the nature of a surprise, although it was not entirely unexpected. The first announcement of the sale was made on Wednesday, the 28th ult.

It is understood that Col. J. M. Schoonmaker, the head of the selling company, will retire from the business, while S. L. Schoonmaker and J. S. Schoonmaker will continue with the Frick Company.

These purchases enable the last-named firm to possess a controlling interest in the Connellsville coke region. There are now 13,540 completed ovens in the region, of which 1214 are operated by owners of blast-furnaces for their own immediate use. The product of these latter do not enter the coke market at all, so that the actual number of ovens in trade is 12,326. The Frick Company already own and control 5736 of these. The Schoonmaker and Moore Works will swell this total to 7819, or nearly two-thirds of the competitive coke ovens of the entire region. The Frick Company have 250 half-completed ovens at Leisenring No. 3, 150 projected at Morewood and 50 at Wynn, making 450 in all. When these are completed they will own 8269 ovens, with a capacity of 15,000 tons, or over 800 cars, per day. Commensurate with this immense capacity will be the coal land holdings of the company, aggregating about 27,000 acres, or fully two-thirds of the coking coal yet remaining in the region. It is also stated on good authority that the Frick Company are endeavoring to secure control of the coke plant of the Cambria Iron Company, containing 680 ovens and over 1000 acres of coal lands, and that W. J. Rainey has been asked to put a price on his works, which contain 699 ovens.

A Blue-Grass Palace.

A unique conception among exhibition buildings is the so-called blue-grass palace which has been erected at Creston, Iowa. The corn palace is now an established autumnal institution at Sioux City, Iowa, and the dwellers in the blue-grass region of the same State have concluded that their own favorite natural product was equally worthy of public notoriety. As described in an exchange, the blue-grass palace is a strange creation of the unique and beautiful in art, in design and execution. One hundred feet square, and with its topmost spire rising 120 feet in hight, and standing out upon the summit of the highest point between Burlington and Omaha, it looks from a distance like one of the old castles to be seen along the Rhine. Of course the supporting structure is of heavy timbers, but all these are so completely covered over with grass and grains that no sign of wood is seen from without and only the floorways and the winding stairs are visible within; and the stalls and galleries and arches are beautified in every conceivable way by curious designs wrought from combinations of the many-colored growths from the field, the meadow and the garden. The blue grass seems to be the natural successor to the wild prairie-grass, and when the prairies are pastured for a few years, without sowing a seed, the tame grass takes the place of the wild, and from some peculiarity in the soil and climate, like the buffalo grass of Colorado, it ripens and cures on the field without losing its nutritive qualities. Hence farmers do not cut the blue grass at all, but after pasturing till about the 1st of June permit it to grow till fall, when it reaches a hight of some 2 feet, and then bends over and forms a heavy dry pasturage, upon which cattle and horses will thrive all winter; and then it is by six weeks the earliest pasturage of the spring.

On Wednesday evening, October 2, the class in the Theory and Practice of Steam Engineering of the Young Men's Institute, 222 and 224 Bowery, will hold its first session, continuing till April 30, 1890, every Wednesday and Friday evening. The class, which is to give instruction to firemen, apprentices and engineers, will be taught by W. H. Wrightman, a well-known mechanical engineer. Applications for admission should be addressed to E. C. Baldwin, acting secretary.

The Lunkenheimer Brass Mfg. Company, successors to F. Lunkenheimer (Cincinnati Brass Works), have made extensive improvements for the manufacture of their goods. They have built a large four-story brick addition, and have added 15 new lathes, especially constructed for the manufacture of their improved (S) regrinding globe, check and radiator valves, pop safety-valves, sight-feed lubricators, oil and grease cups, also a complete line of engine builders' brass goods. Their capacity is increased nearly 25 per cent., thus making theirs the largest brass manufacturing establishment in the West, employing over 200 hands.

Two important "finds" are reported to have been made in Illinois last week. One was the discovery of a 5 and a 6 foot vein of coal near Ottawa, each lying at a depth of but 100 feet from the surface. The other was the discovery of natural gas at Washington, 12 miles east of Peoria, where some workmen have been sinking a well for gas with very successful results, the flow being pronounced equal in volume to the largest Indiana wells. These are important additions to the natural riches of the prairie State, if the reports concerning them have not been exaggerated.

The Government has arranged for a test at Annapolis of the deflective armor designed by Chief Engineer Clark, of the navy. The armor consists of a double-curved turtle-back turret designed for the deck of a ship to protect a gun. It is 4 inches thick. The inventor claims that it will deflect a shot that would penetrate 13 inches of iron. The experimental turret to be fired at cost nearly $19,000.

R. Heckscher & Son's Swede Furnace, at Swedeland, Pa., has outdone her best record last week by making 710 tons. The best day's work was 114 tons, on August 28. Alfred Walters is the superintendent.

The Thomson Electric Welding Company are to increase their capital stock from 5000 to 10,000 shares at $100. For the old shares $325 has been bid lately. The company build the machines and lease them for a price to equal their cost. They then charge a royalty for each act of welding, and the machines are self-registering. It has taken some months for the company to determine the basis of royalties and for obvious reasons The general principle established is that the company shall receive 33 per cent. of the saving of this method of welding over the old methods, but this method being entirely new, it could not be told without experiment what the gross saving was. Until now the company have made little effort to place their machines. They will now set agents at work and cultivate the field systematically.

The third section for the large new steam-hammer at the ordnance department, Bethlehem Iron Company plant, has been cast. It is a 50-ton casting, requiring the product of six cupolas in the Bessemer department. Two sections of housings of 50 and 90 tons each have recently been successfully cast.

John J. Burr, a member of the firm of Hand, Burr & Co., iron merchants, Philadelphia, died on Friday evening. Mr. Burr, who was in his sixty-fifth year, was born near Mount Holly, N. J., and at an early age entered the house of Curtis & Hand, the predecessors of the present establishment, when he was but 14 years old.

O. W. Meysenburg & Co., of Chicago, have secured the contract for cabling a street railway in Minneapolis, Minn The work will require some 4000 tons of castings for yokes, &c., which will probably be manufactured at an outside foundry and not at Chicago.

Owing to heavy orders, the Prospect Rolling Mill Company, of Cleveland, Ohio, have been compelled to build an addition to their mill of 80 x 60 feet, and to increase their puddling department by building six more furnaces.

Hardware.

Reports from most of the interior Hardware centers indicate a satisfactory condition of trade and show that the present volume of business is about up to the average. There is some complaint in special lines, but the indications point to a good fall trade. Prices are in general unchanged and do not give much sign of improvement except in heavy goods, in which there is a somewhat better feeling.

Cut Nails.

There has been no change in the situation in the New York market, prices remaining $1.80 to $1.90 for carloads on dock.

The Pottstown Iron Company, of Pottstown, Pa., are sending out samples of their new Chisel-Pointed Nail, which they make with the special view of meeting the requirements of the trade for a light, quick-driving, fast-holding Nail. They claim that there is no better form than the Cut Nail for fast-holding, since it has parallel sides and wedge-shaped edges. In alluding to the new feature of their Nail they state that it supplies to the ordinary Cut Nail that which the gimlet-point supplied to the old-fashioned Screw. They urge that the chisel point cuts its way into the grain of the wood without mutilating the fiber and thus prevents the penetration of water and consequent rotting of the wood.

Barb-Wire.

There is not much activity in the New York Barb-Wire market and prices are without recent change. The advance in the price of raw materials is referred to as likely to induce a firmer tone. Quotations for Galvanized Four Point are 3.50 to 3.55 cents in small lots and 3.30 to 3.55 cents for carloads, with the usual deliveries.

Miscellaneous Prices.

There has been a tendency among the Pump manufacturers the last year or two to lower their prices, and in some instances makers have placed upon the market special Pumps offered at exceedingly low figures. These goods, however, are made of much lighter castings and are smaller in every way than the regular goods, so that they are not in reality as desirable, except for that class of trade that desires cheapness at the expense of quality. In Pumps there is reported to be a steady and generally satisfactory demand, and a tendency is noticeable toward an increased export business, some makers reporting sales quite active in this direction.

Since our last report there has been no change in the Cordage market, prices remaining weak, with a lower tendency. The National Cordage Company still hold control of the market, and as their policy is understood to be the lowering of prices it is not thought likely that higher figures will be made in the near future. The object of the company is said to be to force down prices of Hemp, so that orders for their future needs may be placed at satisfactory figures. Another feature of the situation is the fact that some leading makers in Philadelphia and New York, as well as most of the Eastern manufacturers, are outside of the combination, and it is thought that the policy of the National Cordage Company is to keep prices low in order to induce them to enter the combination. It will thus be seen that the weakness of prices does not in any way indicate that the association controlling the market is likely to be dissolved.

A large business has recently been done in Loaded Shells, and prices are perhaps a shade stiffer. The trade have recognized that the goods were offered at exceedingly low figures and liberal orders have accordingly been placed. Some difficulty is being experienced in filling these orders as rapidly as desired by purchasers.

The low prices of Lead have not yet affected the Shot market, but it is expected unless there is a recovery in the raw material that a decline in Shot will soon be announced.

Simpson, Hall, Miller, & Co., Wallingford, Conn., issue a sheet of net prices of William Rogers' Knives, Forks, &c., triple and quadruple plated Steel. In it quotations are given on their extensive line of these goods.

In sympathy with the advance in Rods and Billets, Wire is perceptibly firmer, most of the manufacturers withdrawing their extreme quotations, and in some cases effecting sales at advanced prices.

There is also a slight improvement in the tone of the market on Heavy Hardware, although comparatively few advanced prices are announced. Manufacturers are, however, withdrawing some of the exceptional inducements which were recently offered in the way of special prices, and are disposed to hold the goods firmly at the figures recently ruling. In this class of goods an excellent feeling prevails, and makers are anticipating that buyers will come to their terms.

Artistic Hardware.

We are indebted to Henry R. Towne, of the Yale & Towne Mfg. Company, Stamford, Conn., for the following contribution in regard to artistic metal-work, especially in the line of Builders' Hardware. His suggestions as to the opportunity given to Hardware merchants in promoting the introduction and sale of such artistic goods are deserving of careful attention:

I take pleasure in responding to your request to express my views regarding the future development in this country of the higher grade of metal-work for house decoration, especially in the line of builders' hardware. The subject is one in which I have had a long business experience, in which I take great interest, and which my recent visit to Europe has given me fresh opportunity and occasion to study.

The contrast between American and European practice in the higher grades of builders' hardware is very marked. English practice approximates quite closely to ours, but their use of decorative metal-work for inside finish is less than ours, both in extent and variety. On the Continent the facts are reversed, and in France and Germany especially much larger use is made than with us of ornamental metal-work for the interior decoration of buildings of all kinds. Referring to these countries, I think it is a fair statement to say that the mechanical qualities of the better class of builders' hardware are inferior to those of that in use here, while the artistic qualities are much better. Heretofore American designers have utilized the inventive faculties for which they are noted to improve the mechanical or working details of the many articles included under the head of "builders' hardware," the result being that we undoubtedly lead the world in the variety and adaptability and often in the cheapness of our products of this class. Until very recently there has been an unfortunate want of appreciation of the artistic side of the question, due largely to entire absence of training and to equal want of any facilities for acquiring such training, the result being either that the articles produced have been needlessly plain and ungraceful or else, where an attempt at ornamentation has been made, have in most cases been still worse and often hopelessly ugly. If American manufacturers can ingraft upon the mechanical excellence to which they have already attained a reasonable degree of artistic merit, their products will become easily the best in the world.

In seeking to accomplish such a reform, however, manufacturers are to a large extent dependent on the co-operation of the trade. Obviously the commercial considerations of their business require that the goods which they produce shall be saleable, and in the main, therefore, they produce those things which the trade calls for. As the business is now conducted it is probably fair to say that dealers habitually purchase and seek to sell those goods on which they expect to realize the largest profit. This condition will always exist and must be recognized.

I believe, however, that the lack of interest in goods of artistic merit which is shown by the average dealer is due largely to his ignoring the fact that these goods, if properly presented to his customers, may ultimately become a source of larger profit than almost any others usually included in the line of builders' hardware. It is notorious that the margin of profit on nails, screws, butts and other articles of staple use is smaller than on other goods less commonly called for. The same holds true in other lines of business, as for example in the grocery trade, where sugar, flour, coffee, &c., yield the smallest profits. Indeed, it is substantially true in all trades that larger profits are made on articles which are not in universal demand and in which, therefore, competition is not so keen, and especially on goods which are chiefly sold to the wealthier class of customers, who think more of purchasing articles which are entirely to their taste than of buying at absolutely the lowest price. It is for this reason that, in my opinion, hardware dealers, especially in the larger and growing cities, are neglecting an opportunity to realize larger profits by not giving greater attention to the introduction and sale of artistic metal-work for use in the trimming of buildings of all kinds, both public and private.

It may be objected that the hardware dealer, like the manufacturer, is selling what his customers call for and prefer, but I do not think that this answer meets the case. His customers, in most cases, buy the cheaper and less pleasing goods simply because they know little or nothing of any others, or else because they are told that goods of artistic quality can only be had at extravagant prices. If, on the contrary, the retail dealer will provide himself with even a small line of samples, or will obtain from reputable makers a few photographs of artistic metal-work, it will be found in many cases that very little persuasion is required to induce a customer to substitute the latter for the former. A few dollars thus added to the investment in the metal-work of any ordinary residence will often furnish the owner with articles of genuine merit and of tasteful design and good workmanship, which will always be a pleasing feature in the decoration of his house and which will be permanently satisfactory. I do not believe that the cases are numerous where, if this issue were fairly and honestly presented, the owner would economize the amount of this small difference by the substitution of cheaper goods, which, if not positively trashy, are almost invariably of gaudy and meretricious design, not in harmony with the surrounding decorations and certainly not attractive or restful to the eye.

My argument, therefore, is that the remedy in this case lies chiefly with the retail dealer. Now, what is the inducement on his part to lead the reform? Simply this: That a reform in these matters is evidently coming and is merely a question of time; that if one dealer does not enlist in the cause his competitor will surely do so; that in this as in other

things those who first enter a new field and become prominently identified with it almost always secure the largest harvest and hold the strongest position in the market, and, finally, that goods of the class in question, if they are properly handled, will always yield a larger margin of profit than the cheaper and more competitive grades, and that hence there is the strongest pecuniary inducement to secure a leading position in their sale.

The question as to how this is to be done is easily answered. It implies, first of all, a careful study of the subject by the dealer to acquaint himself thoroughly with the relative quality of the products of leading manufacturers. This should be done by a personal inspection of the goods, both as furnished to customers and as exhibited in show-rooms, too large a dependence not being placed upon catalogues or the glowing descriptions of manufacturers. If the salesman is in earnest he will still further seek to qualify himself for intelligently conducting the business by making some study of authorities and by seeking to acquaint himself with at least the rudiments of the art of decoration, so that he may intelligently discuss schools of design and features of ornament with architects and their clients. Among the books useful in this way may be mentioned those in the list given below:*

A LIST OF USEFUL BOOKS ON DECORATION AND METAL-WORK.

ARCHITECTURAL WROUGHT-IRON, ANCIENT AND MODERN. By W. W. Kent, architect. Published by W. T. Comstock, New York. Price, $5.

SYSTEMATISCHES GEORDNETES DER ORNAMENTIK. By Franz Sales-Meyer. May be procured from G. E. Stechert's, No. 828 Broadway, New York. Price, $3. The book is on ornamental forms and patterns classified and is not confined to iron-work.

LA COMPOSITION DECORATIVE. Published under the patronage of Ecole des Beaux-Arts, Paris, France. A large series of excellent engravings. Each number costing 50 cents in paper covers, or $1.25 in cloth. Can be had separately, and each is complete in itself. The illustrations are very fine.

AUS DER KUNST-SCHMIEDE-EISEN-SAMMLUNG DES ARCHT. FREDERICH HALSELMAN. Can be had from B. T. Botsford, High Holborn, London. Price in London, $12. Consists entirely of illustrations and contains an excellent collection of mediæval wrought-iron work.

THE GRAMMAR OF ORNAMENT. By Owen Jones. This standard work is the most complete and desirable ever published, but its cost has heretofore greatly limited its use. A cheaper edition has lately been published which, it is said, can be procured for about $20. The book covers the whole field of ornament, and its cost would be more wisely invested in the purchase of this volume than in all of the others in this list.

ANALYSIS OF ORNAMENT. By R. N. Wornum. This is a small and inexpensive book, published in London, containing a few illustrations and covering an excellent explanation of the rudiments of the art of decoration.

Finally, it involves the procurement of proper samples and photographs, carefully selected but not necessarily numerous, for use in presenting the subject to customers, and also a reasonable stock of such goods as are frequently in demand, this stock being carefully selected by the dealer himself, using his best taste and skill to insure that every article is of its kind well designed and well made. By proper care it is possible, even with the cheaper kinds of goods, to select those which, if not highly artistic, are at least simple and unobjectionable in their ornamentation. Plain work, either in brass or iron, if well proportioned, is always in good taste, and should be freely used where more elaborate ornamentation is not desired. If the dealer thus equipped and having himself an intelligent understanding of the subject will be true to his convictions and entirely honest in his representations to customers, the latter will soon learn to value his judgment and be guided by it in their purchases.

It will doubtless seem to many that the above is an exaggerated if not an impracticable view to take of the functions of a dealer in hardware. To such I beg to reply that this country, in its older parts at least, is passing beyond the log-cabin period and is entering upon a new era, one of the obvious features of which is a larger and constantly increasing degree of attention to what has been aptly called "the house beautiful." In architecture, carpentry, mural decoration and nearly everything else which enters into the construction and adornment of the dwelling the increasing taste of the people and a constantly growing demand for better things has long since made it profitable to those engaged in those industies to qualify themselves in the manner I have indicated. I predict that a similar change will before long take place in what in olden times was known as "the locksmith's art"—that is, in the use of ornamental metal-work for the interior of buildings. If I am right in this, those who are first to appreciate the coming change and to identify themselves with its development will secure the largest share of the harvest, as it is eminently right that they should do.

Respectfully, HENRY R. TOWNE.

Items.

At a special meeting of the stockholders of the Simmons Hardware Company, St. Louis, Mo., held August 14, it was decided to increase the number of directors to eight, and the following new members were elected: R. H. Stockton, J. E. Pilcher, H. M. Meier, J. E. Smith and C. E. Smiley. The new board subsequently met and organized by electing the following officers: E. C. Simmons, president; I. W. Morton, vice-president; R. H. Stockton, second vice-president; J. E. Pilcher, third vice-president; H. M. Meier, secretary; J. E. Smith, assistant secretary; A. E. Dann, treasurer, and C. D. Smiley, assistant treasurer.

Pratt & Letchworth, Buffalo, N. Y., have recently issued a vest-pocket edition of their Hame catalogue. It is a neatly-printed and fully-illustrated book of more than 100 pages, which, from its size, 5½ x 2½ inches, is well adapted to being carried in the vest pocket. They are also preparing a catalogue of Saddlery Hardware, which is now in the printer's hands. Their latest catalogue of Malleable Iron and Carriage Hardware, issued last year, represents an extensive assortment of this class of goods and is brought up to date by extra pages which represent their recent additions. The extent of these indicate the enterprise of the house. Their catalogue of specialties for Carriage and Sleigh builders' use is of interest as showing a number of novelties and leading goods in this line.

A recent issue of the Wheeling (W. Va.) *Intelligencer* says:

There has been a fairly well-defined rumor afloat for the past few days to the effect that a meeting of nailers had been held at which the question of cutting the light-gauge Nail was discussed, and that the decision arrived at was to cut it without demanding an advance whenever it was offered to them by the manufacturers. A determined effort to verify this rumor was not, however, successful. No less than 20 of the most prominent nailers in town were seen, but they all denied any knowledge of any such meeting. It was learned, however, that the light-gauge Nail is being cut in nearly all the mills, but only as the trade demands them, and while the nailers may not have had a meeting and formally decided to cut these Nails, there appears to have been a mutual understanding arrived at that such a course was the best one to pursue. The Belmont has thus far sold about 4500 kegs of the light-gauge Nail. At the LaBelle they are making whatever kind of Nail the trade wants, and they find that the orders for sizes different from the standard are more frequently for a heavier than a light gauge. The Laughlin and Bellaire factories are also reported to be making whatever the buyers want.

Buehler, Bonbright & Co., 427 Market and 416 Commerce streets, Philadelphia, Pa., issue a neat pamphlet, giving a condensed wholesale pocket business directory of Philadelphia, intended for the use of out-of-town buyers. Many of the leading goods handled by them are also represented in the advertising pages, while the middle of the book is blank, intended for memoranda, &c. There is in it also a convenient reminder for buyers, in which many leading lines of goods are designated, with space for quotations.

Hartley & Graham, 17 and 19 Maiden lane, have issued a very complete list of Guns, Revolvers, Ammunition and Sporting goods. In it about 100 large pages, compactly arranged, are devoted to the display of many leading Arms, Gun Tools, &c., of which excellent illustrations are given. Attention is also prominently called to the fact that they are agents for the Union Metallic Cartridge Company, Bridgeport Gun Implement Company, Remington Arms Company and a number of other manufacturers in this line. The catalogue is accompanied by a price-current and discount sheet. Separate circulars relating to the Plymouth Air Gun and Remington Single-Shot Pistols are issued and attention called to bargains in Colt's Revolvers.

Wells Bros. & Co., Greenfield, Mass., request us to call the attention of the trade to the fact that they are the exclusive and only sales agents of Stratton Bros.' Improved Spirit-Levels, intimating that certain manufacturers are sending out goods with labels attached designating them as Stratton Bros.' pattern. These goods, they advise us, are not of the Stratton Bros.' make, and that every Level of this make has their name stamped upon it.

Shepard Hardware Company, Buffalo, N. Y., have issued a price-list of their Excelsior series of Toy Savings-Banks. Eleven different patterns are represented, including those recently put on the market of which descriptions have appeared in our columns.

The Excelsior Foundry Company, Cincinnati, Ohio, issue a price-list of their Letter-Copying Presses. It is elegantly printed and shows the different styles in which the Presses are put on the market. The special features possessed by them are also enumerated and attention called to the advantages.

The Illinois Iron and Bolt Company have recently issued a handsome new catalogue, illustrating in it several kinds of Wagon Skeins, for which they have a large line of patterns, comprising over 100 different styles and shapes, from the common to the latest improved Skein, with Oiler, Oil-Chamber, Truss and Draft Lugs, Clip Attachments, &c. This company are said to be the largest Wagon Skein manufacturers in the world, completing 2400 Skeins or more each day. Their trade in this line has grown to large proportions, and their facilities are constantly being improved to keep pace with their customers' demands. We also find in their catalogue Hydraulic Presses, for pressing Skeins on Axles and Skein-Boxes into Hubs, and other similar work where a great pressure and quick action are required. Also a line of horizontal and upright blacksmiths' and machinists' Drills, Tire-Benders and Shrinkers, Tuyere Irons, Anvils and other tools, wood-workers' and machinists' Vises, Sad-Irons, Clothes-Reels and lawn

* Most of these books can be obtained from David Williams, 66 and 68 Duane street, New York.

ornaments. They also illustrate a large line of Jack-Screws. On account of their increased business this company have been compelled to build an extensive addition to their foundry, which is just being completed. They advise us that they are now prepared to fill their orders promptly.

The Newhall Ship Chandlery Company, Henry B. Newhall Company, 105 Chambers street, New York, have issued a new catalogue showing their extensive line of Ship-Chandlery Goods, to which more than 100 pages are devoted, with illustrations, price-lists, &c. The compact and convenient arrangement of the book presents this well-known line of goods attractively to the trade.

A disastrous fire August 27 destroyed the three-story factory of E. B. Lanman, Columbus, Ohio, but preparations are already making for immediate rebuilding. In an Associated Press dispatch relating to this fire the factory of the Columbus Bolt Works was referred to as having been destroyed and the company have issued a circular contradicting the report, and stating that both their Bolt and Drop Forging works are intact and that they are in a position to fill orders promptly.

Gibson, Parish & Co., prominent Cabinet Hardware merchants, at Chicago, have been forced to make application for a receiver through the error of their bookkeeper.

John R. Calhoun & Co., who are well known to the jobbers in the Vehicle and Implement trade, have recommenced business as brokers and manufacturers' agents, at 1100 North Broadway, St. Louis. Mr. Calhoun informs us, notwithstanding his temporary retirement from business, he is rapidly regaining his old trade, and making a number of new customers in the Hardware trade, as they are now handling a line of Hardware Specialties. They have secured a lease on a large warehouse on Main street, which they will occupy about October 1 with a full line of the goods represented by them.

A. J. Jordan, St. Louis and Sheffield, manufacturer of the well-known AAA1 Cutlery, sailed for Europe on the steamship City of Paris, which left New York September 4. Mr. Jordan spends a large portion of his time at the Sheffield works, and is thus enabled to give the manufacturing department of his business his personal attention.

Our readers will observe the advertisement on page 65 in which Mills, Knight & Co., Boston, Mass., call attention to their line of Leather Advertising Specialties. It will be seen that some of their leading goods are enumerated there, and we are advised that they have among their customers many of the largest Iron and Hardware manufacturing concerns.

The Hocking Valley Mfg. Company, Lancaster, Ohio, have issued a new illustrated catalogue. It represents the line of Agricultural Implements manufactured by them, of which illustrations and very full and satisfactory descriptions are given. It relates to Corn-Shellers, Feed and Ensilage Cutters, Horse-Powers, Hay-Rakes, Feed-Mills, &c.

The differences between the Branford Lock Works, Branford, Conn., and their iron-molders having been adjusted by a compromise, the works will resume full operations the first of next week.

The trade will observe the advertisement on page 97, in which the Caldwell Mfg. Company, Rochester, N. Y., illustrate the Caldwell Sash-Balance. This company were organized last February by Wm. H. Caldwell and they are engaged actively in the manufacture of Sash-Balances.

Trade Topics.

A correspondent in Ohio refers in the following letter to the condition of trade generally, with special reference to the prices of goods:

OUR WESTERN RETAIL TRADE.

We are looking for more trade, a better feeling and a brighter outlook for the coming year. We are continually handicapped with the diversity of prices made by jobbers and manufacturers. Such things are the hardest the retailer has to fight. I am a firm believer in universal lists on certain lines of goods, and changes only when absolutely necessary—then all makers conforming. Take, for instance, as one among many, the Wire Nail business. In seven weeks three complete changes in lists; on top of this the "level" list. Who is it wants to do business with no business basis to go on? And what clear-headed business man, be he manufacturer or not, does not know that the basis of the Wire Nail manufacture must inevitably conform to cost of production and average of sizes? Nails are Nails, and it must be so. I use this only as an illustration. The same thing as regards changes applies to many other products—the high list and the low list for Emery-Wheels, &c.

With the market still declining for Sisal and Manila and the increased use of Hempen products, we predict the rise and fall of the Cordage Trust. The average Western farmer may be a crank—but he knows when he has enough. So with the manufacturer who is compelled to be a large user of Cordage.

You make an item in your issue August 22, "The manufacturers of Wood Goods also met last week, and adjourned without reaching an understanding." Another, "The manufacturers of Steel Goods held an important meeting last week; the difficulties, however, appear unsurmountable, and the market will continue an open one." The importance of these meetings can hardly be estimated to the buying public. You make the statement, and it is a very true one, that there is no disposition to buy ahead. What merchant, with a market as demoralized as the present one, would care to look three months ahead for stock goods? Show me the merchant that has bought ahead for the last three years and made anything by buying and I'll show you an artist. Dropping complaints, the outlook for a good, strong fall trade is not a bad one. Buildings are going up, factories are starting, men are at work, and all things together may help us to a better, safer season's business than the last one has been.

Freight Classification.

The expressions of the trade in regard to the classification given to Hardware in its many branches show that there is a very general dissatisfaction, for which in many cases there appears to be sufficient ground. This matter, indeed, is one which has often received attention at the hands of manufacturers and large shippers, efforts having been made repeatedly to secure advantageous classifications, but it is evident that the manufacturers regard the correction of the present classifications as a matter of great difficulty, and many of them refer to it as one in which there is but little probability that their efforts will be attended with success, their tone being that of discouragement, as they evidently have the impresson that those who have matter in charge care very little for the interests of shippers, and place upon the goods as high a rating as they will stand. This feeling is reflected in the following letter from a well-known Western manufacturing house:

We have read the editorial of your issue August 8 on Hardware Classification and will state that what the manufacturer says or desires in the matter has no present power to influence the classification committee. The railroad companies charge whatever the gods will stand, and do not seem to investigate anything. We are having plenty of trouble with our goods. One sheet will perhaps fail to mention some of our articles altogether; the next will have rated them first or second class. We show up the unfairness of the thing and succeed in having rates restored to fourth class, when, lo and behold! another classification sheet goes into effect with same old first or second rates, or no mention. We can show up something unjust in classification of everything we make. We can point out goods of more value, bulkier, and less weight, that are taken at lower rates. There is no discrimination or fairness in the present arrangement.

It should, however, be borne in mind while manufacturers have had to bear many annoyances in this matter, and have had their just complaints disregarded repeatedly, they have in a multitude of instances succeeded in securing a better classification for their goods. This should have the effect of stimulating further efforts in this direction. It shows not only what can be done by well-directed effort, but also the willingness of the commissioners to do that which is just and for the advancement of the interests of manufacturers and shippers. There should, therefore, be no let-up on the part of those who have well-founded complaints to make, and facts and arguments should be brought to bear with a view to the correction of existing inequities. The usefulness of discussion has also been illustrated, and the columns of trade papers of standing and influence should be utilized for the bringing of facts prominently to the public attention. When the sentiment of the trade is thus reflected it will, without doubt, have its effect upon those to whom the decision of these matters is left. The success which has attended the agitation of this matter in these columns, especially the placing of Hardware in third instead of second class, as noted in our last issue, should lead manufacturers to move still further in the same direction, and to seek in this same way such amendment of the present classifications of Hardware as will remove the objections which are now found to be burdensome.

The annoyances which result from the present uncertainty and confusion in the classification of Steel Hollow-Ware are pointed out in the following letter, which refers also to the change of classification *en route*:

So far in the manufacture of Steel Hollow-Ware we have been without any classification, some roads taking our goods as Hollow-Ware, some as Stamped-Ware, and some even put our goods in as Tin-Ware. This shows to us the great importance of a uniform and universal classification on manufactured Hardware and kindred lines.

In our central classification, Stamped-Ware, boxed, is rated fourth class. Cast Hollow-Ware third class. In the Western classification Stamped-Ware is second class and Cast Hollow-Ware fourth class. Now, the question with us is, whether in shipping goods to the Missouri River, which is the best classification for us, as Stamped-Ware or Hollow-Ware? In case we deliver as far as Chicago and ship as Stamped-Ware, we save a little for ourselves, but beat our customer.

Now, we would like to have some one explain why we should be compelled to lose money ourselves or beat our customer in order to save for ourselves. We are entitled to a better rate on our goods than given on Cast Hollow-Ware, because we have the same weight and there is positively no breakage. We are certainly entitled to a better rate than Stamped-Ware, because the same package with our goods in would weigh over four times. The greatest annoyance that we are subjected to is that our goods starting from here as Stamped Steel-Ware will often arrive at destination billed as Tin-Ware or Hollow-Ware, the classification having been changed *en route* without cause, and always being given a higher rate. I think manufacturers should join hands all around to ask the Interstate Commissioners to make it obligatory on any road

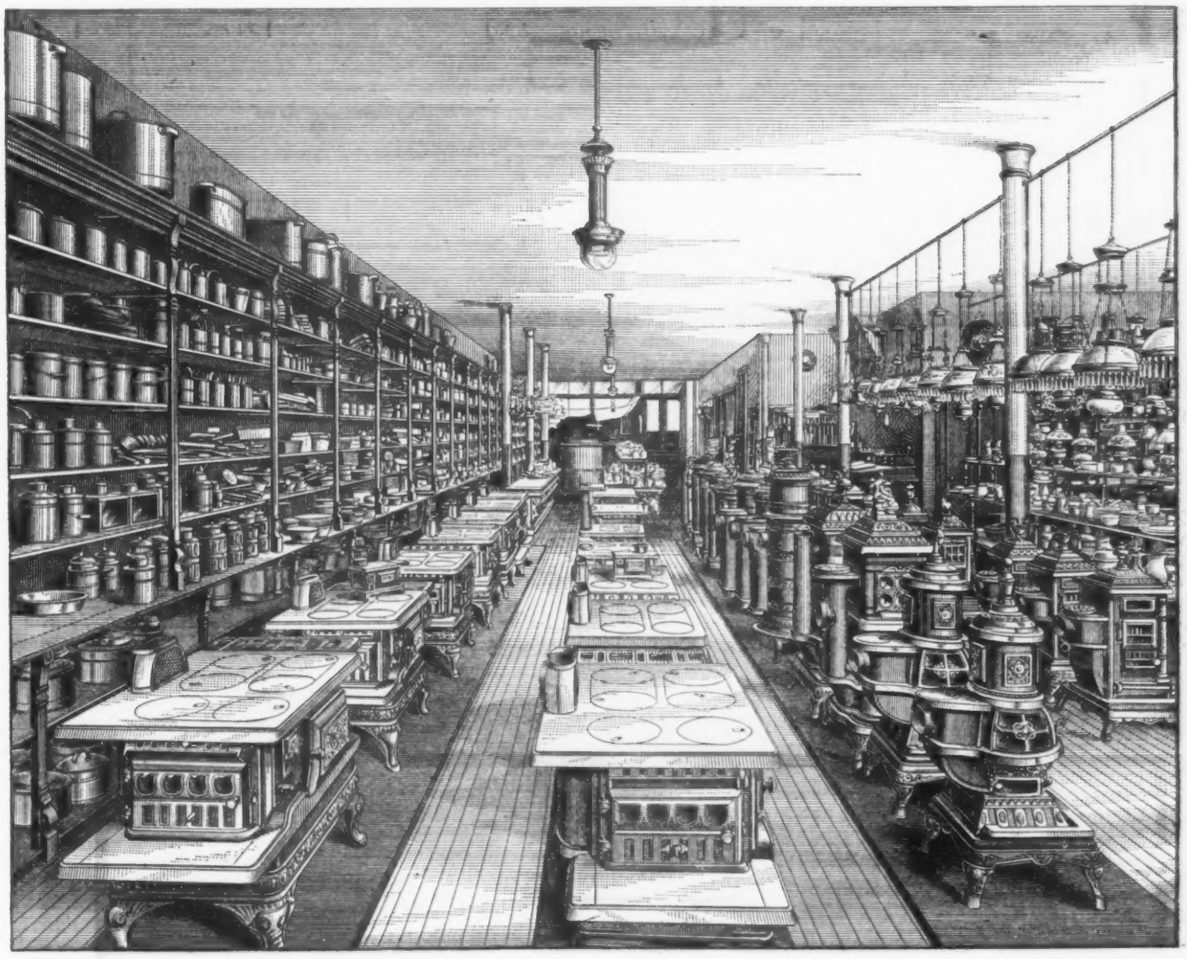
making a joint tariff to carry goods to their destination on through bills of lading under the same classification that the original inspector placed them. Very often these changes to which I have referred cause an overcharge of from 25 to 50 cents each on a bill, an amount too small to put in a claim for, but which the dealer deducts from our invoice. When several overcharges of this charaetcr are coming in daily the aggregate is large We are working hard for a special classification, and shall be very much pleased at any time to join in further discussion on this subject

The following letter from large manufacturers of Wire-Cloth, Wire-Netting, Fencing, &c., refers to the classification of this line, showing that the goods are discriminated against in such a manner as to interfere with the sale of them in markets distant from the factory, while it is also shown that similar goods are given lower grades:

The goods that we manufacture—Wire-Cloth, Lathing, Wire-Netting and Woven Fencing—are entered on the Official Classification No. 6, C. L., 5th class, L. C. L., 3d class. The present tariff for same from the principal Eastern shipping points, including ours, to Chicago is 30 cents and 50 cents per 100 pounds respectively, and to other points proportionately. Steel Wire, the material we use principally, is included in the special iron tariff, the rate on which is 18 cents and 20 cents per 100 pounds respectively. We can see no reason why our goods are not entitled to as low a classification as some other articles under this special head, such as Door-Mats, Barb-Wire, Galvanized and Coppered Wire, &c. The value per pound will average no higher, they are about as compact, unlikely to be damaged and are as easily handled. Door-Mats, for instance, weigh exactly same as Wire-Cloth per cubic foot and the value of the Mats is 33 1-3 per cent. more than that of the Cloth. The rate on the Mats, L. C. L., would be 20 cents per 100 pounds, while the same weight and bulk of Wire-Cloth would be at 50 cents per 100 pounds. It is at once apparent that such marked discrimination can have no other tendency than to prevent us from entering a market in the vicinity of competing manufacturers and where there are none the tariff works a decided injustice to the public. We have been endeavoring to introduce our Fencing as a farm Fence in competition with Barb-Wire, but such odds will be difficult to overcome.

Arrangement of Stores.

What is probably one of the most attractive retail stove stores in the State of Connecticut is that occupied by the firm of Samuel H. Beard & Co., No. 186–192 Main street and 8 and 10 Court street, New Britain. This store has recently been completed and occupied by the firm named and is arranged in a very convenient manner. The building is a four and a half story brick structure of pleasing architectural design, and the firm occupy the ground floor and the basement. The store measures 110 feet in length and 40 feet in width. The entire front and rear are glass, as well as the side show-window on Court street. It is further lighted by a sky-light, 5 x 20 feet, located on the south side of the building, and by other windows in the north side. The show-window at the left of the main entrance is 16 feet 7 inches wide, the one at the right 7 feet, while the one on Court street is 8 feet 7 inches wide. The yard in the rear is 150 feet deep and is used for the storage of drain-pipe and other goods. In Fig. 378 of the accompanying illustrations we show an interior view of this store, standing at a point just left of the main entrance and looking toward the rear. An inspection of this picture will convey to the reader a very clear idea of the general arrangement of heating and cooking stoves, lamp goods, tin-ware, &c. Fig. 379 of the cuts shows the ground plan. From this it will be seen that at the left of the main entrance are platforms for stoves in winter and refrigerators in summer. These platforms are 32 feet long, 2 feet 11 inches wide and 3 inches high. Beyond this are the counters for glass-ware, lamps, trimmings, &c., while further in the rear are steam and hot-water heaters, furnaces, sample radiators, brass-pipe fittings, and the like. The shelving at the left is used for hollow-ware, wooden ware, brushes and wire goods. At the right of the store as you enter is a fountain in which are gold-fish. Beyond the fountain are counters for crockery and three-deck tables with drawers underneath for storage purposes. Still further toward the rear is the office, a room 6 x 16 feet in size and provided with the necessary furniture. The elevator is immediately in the rear of the office and communicates with the basement, being used for raising and lowering goods. Boyond this is the tin-shop, with work-benches placed at the right and under numerous windows, which give plenty of light. The three-deck tables referred to are 23 feet long and 3 feet 3 inches wide. The top shelf is 18 inches wide, and the drawers in the base of the table are eight in number. A partial view of one of these tables is shown in Fig. 380 of the accompanying illustrations. The posts supporting the second and third



Arrangement of Stores.—Fig. 378.—Interior View of Store of S. H. Beard & Co., Looking Down the Left-Hand Side of the Room.

shelves are turned, giving a neat and tasteful appearance to the table. The second shelf is provided with a slide which pulls out and is designed to place goods upon when showing them to the customer. An interesting device which the firm employ for suspending some of the goods kept in stock is shown in Fig. 381 of the cuts. This consists of a band made in two parts, which fit around a post and are drawn together with a bolt, all as clearly shown in the engraving. From this band project arms upon the ends of which are hooks. From these are suspended bird-cages, brushes, feather dusters and other goods. Fig. 382 of the illustrations shows the basement of the store. The front of this is divided into two apartments, one being used as a work-shop and for steam-fitting and plumbing purposes, while the other is devoted to the storage of old stoves, tin, pipe and stock. To the rear of the work-shop is a large room for storing stock, with bins for shelf goods. Opposite this room is an apartment for stove repairs, old metal, and a room for receiving goods to be opened. Light is given to the various rooms in the basement by means of Hyatt lights in the sidewalk. The space is economically distributed, and the firm feel that while their establishment may not be as pretentious as some retail stores in the country, its arrangement is well calculated to serve their purposes.

Show-Window Attractions.

A dealer writes: It is strange how people notice anything unusual in a show-window. A man sawing wood on the street would attract little attention, but place him in a show-window and a crowd would soon collect to witness the unusual sight. A saw-buck and saw would hardly be noticed, but place it on a stick of wood, with sawed sticks, saw-dust, &c., on the floor, so it would appear that some one had just left off sawing wood, and then the sight becomes unusual and will attract attention. The dealer who wishes to have the public notice his store must study up new combinations. About as unique a shop-window advertising dodge as I have run across in many a day, says a writer in the Chicago *Evening Journal*, is that adopted by a certain jeweler who occupies a store on a leading street. On a georgeous cushion of silk, close up against the glass and inside the window, there reposes a magnificent Angora cat, of splendid proportions and with hair as long and silky as a St. Charles spaniel's. The animal is spotlessly clean, of course, and its beauty alone would attract the attention of passers by. It is the jewels which adorn the cat, however, that most excite the admiration of those who stop to gaze in at the window. Across the soft fur of its back is stretched a harness of narrow silk bands, and to this harness are attached a number of gems of rare beauty and infinite costliness. The eye and the imagination are thus both caught, and the result is that the window is always besieged during the busy hour of the day by a crowd of pedestrians, who jostle and push each other in the effort to get a good view of the jeweled cat. The sleek animal looks as if it enjoyed the attention it excites, for it rises now and then to its feet, yawns heartily and walks around in a circle as if to show off its own good points and the beauty of its adornment to the best advantage. Aside from the jewels, it is the handsomest animal of its species that I have ever seen.

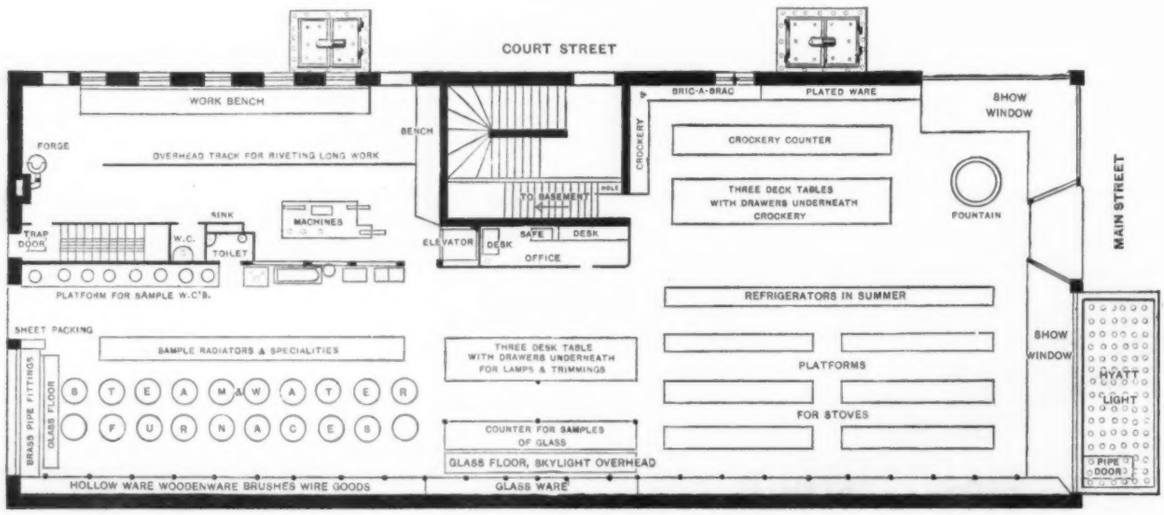


Fig. 379.—Ground Plan.

Obituary.

John R. Scott, a well-known Hardware merchant of Chicago, died on the 29th ult. of paralysis. Mr. Scott was less than 40 years of age, and his untimely demise is regretted by all who have had business

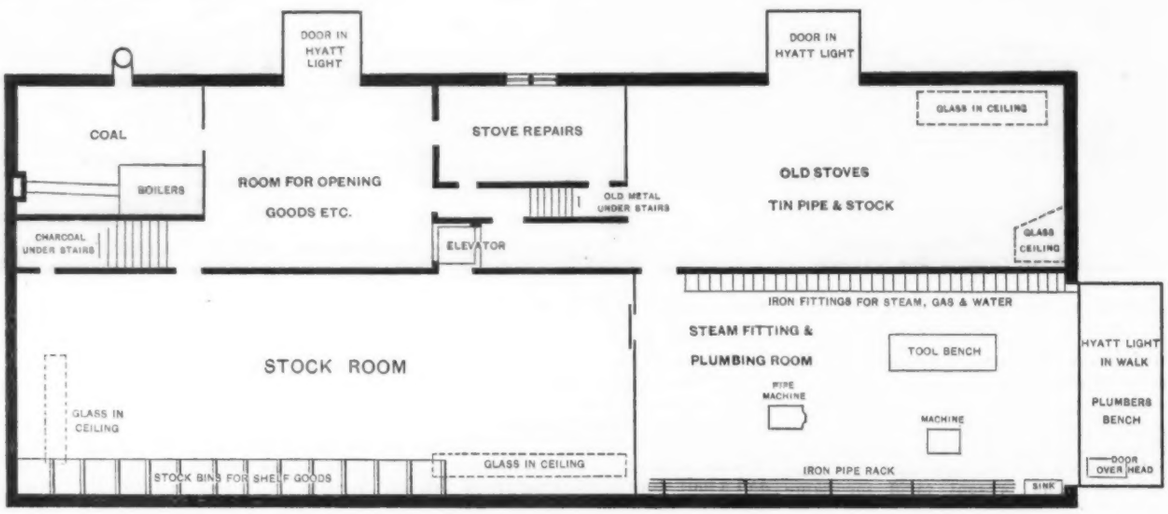


Fig. 382.—Plan of Basement.

John R. Scott was connected with the Chicago Hardware house of Kellogg, Johnson & Bliss for 12 years, first as salesman and afterward as a member of the firm, withdrawing in 1887 to assist in

the management of the Chicago branch of P. & F. Corbin. In May of the present year he engaged in business on his own account, making a specialty of Builders' Hardware, which was the line in which he had achieved special distinction in the Hardware trade. He leaves a widow and one child.

Exports.

PER BARK BALTIMORE, AUGUST, 5, 1889, FOR PORT NATAL, SOUTH AFRICA.

By Coombs, Crosby & Eddy.—9 packages Carriages and Parts, 7 packages Carriages and Parts, 188 bundles Building Material, 20 cases Scales, 8 dozen Picks, 30 dozen Edge Tools, 12 Ladders, 50 dozen Edge Tools, 6

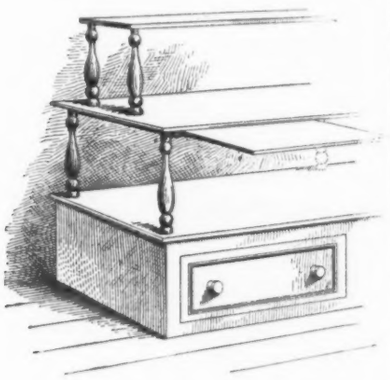


Fig. 380.—End of Three-Deck Table.

packages Wood-Ware, 18 dozen Edge Tools, 18 cases Plows and Parts, 12 Hay-Cutters, 13 Corn-Shellers, 32 Store-Trucks, 12 Hand-Carts, 6 dozen Wheel-Barrows, 4 cases Child's Carriages, 18 Ladders, 18 Meat-Choppers, 2 cases Wagon-Ware, 12 Wringers, 16 Washers, 18 Manglers, 50 dozen Brooms, 12 dozen Edge Tools, 100 bundles Building Material, 760 pounds Sash-Weights, 3 dozen Hammers, 5 dozen Braces, 9 dozen Hammers, 6 dozen Picks, 14 bundles Carriage-Ware, 1 case House-Furnishing Goods, 1 case Wire Goods, 12½ dozen Carpenters' Tools, 15 dozen Tools, 6 packages Carriages and Parts, 11 packages Carriages and Parts, 7 packages Carriages and Parts, 36 Pumps, 83 bundles Building Material, 6 Scales, 2½ dozen Step-Ladders, 4 dozen Picks, 2 cases Saw-Handles, 1 dozen Picks, 6 dozen Stair-Fixtures, 1 case House-Furnishing Goods, 1000 pounds Sash-Weights, 46 pounds Sash-Cords, 6 Store-Trucks, 12 Wheel-Barrows, 6 Lawn-Mowers, 380 pounds Sash-Weights, 10 dozen Wash-Boards, 16 Plows, 10 dozen Axes and Picks, 8 Corn-Shellers, 1186 dozen Wood Handles, 12 Wringers, 16 Plows, 2500 Handles, 14 Pumps, 20 dozen Axes, 40 dozen Wood Handles, 5 dozen Saws, 3 packages Carriages, 28 dozen Axes, 5 dozen Tools, 10 dozen Axes, 5 dozen Saws, 30 dozen Axes, 30 cases Axle-Grease, 15 Scales, 20 dozen Edge Tools, 40 dozen Edge Tools, 338 Wood Handles, 39 cases Plows and Parts, 4 Corn-Shellers, 18 Meat-Cutters, 6 Churns, 120 dozen Hatchets, 12 dozen Picks, 221 pounds Seeds, 15 dozen Tools, 3 Forges, 2 cases Hardware, 48 dozen Tools, 4 Well-Wheels, 38 dozen Tools, 6 Grindstones and Fixtures, 10 dozen Tools, 6 cases Japanned Tin-Ware, 2 Carriages, 3 cases Japanned Tin-Ware, 16 dozen Tools, 1 dozen Grindstones, 18 Scales, 2 dozen Mouse-Traps, 15 Pumps, 3 dozen Wrenches.

PER SHIP MORIALTA, AUGUST 13, 1889, FOR MELBOURNE, AUSTRALIA.

By W. Lunham.—13 cases Axles.
By Meriden Britannia Company.—12 packages Plated-Ware.
By Ansonia Clock Company.—35 boxes Clocks.
By W. & B. Douglas.—3 casks Pumps.
By Plumb, Burdict & Barnard.—2875 pounds Iron Bolts.
By Russell & Erwin Mfg. Company.—30 packages Hardware.
By Bissell Carpet Sweeper Company.—16 cases Carpet-Sweepers.
By Smith & Nichols.—1440 pounds Axle Grease.
By Crane & McMahon.—5 cases Spokes, 1 case Hubs.
By F. B. Wheeler & Co.—19 dozen Brushes, 26 cases Clocks, 3 cases Iron Bolts.
By Morris, Strouse & Co.—70 dozen Agate Iron-Ware, 6 gross Fruit-Jars, 600 feet Cotton Hose, 3 dozen Toys.
By W. K. Freeman.—3 cases Hardware, 5 packages Plated-Ware, 3 cases Locks and Knobs, 484 pounds Horse Nails.
By A. Field & Co.—8 dozen Hardware, 18 dozen Harness-Ware, 7 dozen Horse Collars.
By Healy & Earl.—16 crates and 5 cases Forges, 14 cases Brads.
By Welsh & Lea.—3 cases Iron Bolts, 20 cases Axes, 20 cases Wringers, 6 cases Iron Bolts, 6 cases Iron Bolts.
By R. W. Cameron & Co.—13 packages Wood-Working Machinery, 46 cases Sewing-Machines, 18 boxes Wind-Mills, 2 boxes Nuts and Bolts.
By H. W. Peabody & Co.—5 barrels Glue, 1 barrel Glue, 2 Trucks, 1 crate Cork-Pullers, 11,708 pounds Barb-Wire, 2340 pounds Barb-Wire, 23,400 pounds Barb-Wire.
By Mailler & Querean.—6 cases Rasps, 31 dozen Axes, 3 cases Hardware, 2 cases Forks, 1 Water-Motor, 12 cases Metal Ceiling, 2 cases Ceiling-Machinery, 5 cases Cultivators, 20 dozen Handles, 5 cases Velocipedes, 16 cases Hubs, 8 cases Spokes, 2 cases Malleables, 1 case Machinery, 1 case Brushes, 12 cases Harness.
By Coombs, Crosby & Eddy.—10,329 pounds Rope, 12 dozen Plated-Ware, 4 dozen Wood Bench-Screws, 12 dozen Plated-Ware, 1½ gross Hardware, 1 gross Shade-Fixtures, 24 dozen Wood Handles, 24 Stoves, 13 dozen Axes, 284 pounds Stoves, 40 dozen Edge Tools, 62 dozen Wood Handles, 8½ dozen Hammers, 10 dozen Hardware, 6½ dozen Whips, ½ dozen Axle-Grease, 1 case Plated-Ware, 4½ dozen Tools, 19 dozen Agricultural Tools.
By McLean Bros. & Rigg.—10 dozen Wringers, 12 dozen Carpet-Sweepers, 3 dozen Seed-Sowers, 12 dozen Gauges, 13 dozen Pumps, 12 dozen Hand-Groovers, ½ dozen Bolt-Clippers, 2 dozen Scales, 2 dozen Ox-Yokes, 5 packages Agricultural Implements, 9 rolls Sand-Paper, 2245 feet Leather Belting.
By W. H. Crossman & Brother.—2 dozen Wringers, 6 dozen Wrenches, 3 dozen Saw-Sets, 80,000 Tags, 12 dozen Oilers, 6 dozen Handles, 600 feet Hose, 2000 Cartridge-Cases, 15 dozen Axes, 1 dozen Carpet-Sweepers, 5 cases Hardware, 12 dozen Oilers, 4 dozen Milk-Cans, 7 gross Shade-Rollers, 37 dozen Axes, 4 dozen Mattocks, 7 dozen Hoes, 2 dozen Wringers, 44 dozen Tacks, 4 dozen Wrenches, 2 gross Shade-Rollers, 110 dozen Handles, 6 dozen Traps, 9 packages Hardware, 17,000 Cartridges, 12 dozen Egg-Beaters, 36 dozen Glue, 3 cases Paint, ½ dozen Guns, 20,000 Shells and Primers, 50 dozen Pails, 1 case Shade-Rollers and Parts, 4½ gross Lead-Pencils, 48 dozen Mop-Handles, 1 dozen Anvils, 2½ dozen Vises, 1 dozen Bench-Screws, 8 sets Stencils, 12 dozen Wrenches, 3 dozen Braces, ½ gross Potato-Mashers, 9 cases Hardware, 4 cases

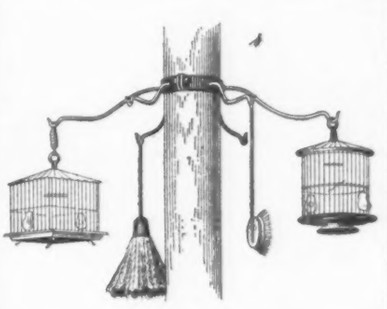


Fig. 381.—Device for Supporting Bird-Cages, Brushes, &c.

Hardware, 6 dozen Hog-Rings, 950 pounds Nails, 6 gross Shade-Rollers, 6 dozen Hardware, 1 dozen Pumps, 4 dozen Latches, 28 dozen Braces, 6 dozen Wringers, 12 dozen Handles, 1 dozen Anvils, 50 Lawn-Mowers, 30½ gross Fruit-Jars, 19 cases Hardware, 50 dozen Oilers, 1 dozen Wire Mats, 100 pounds Nails, 25 dozen Latches, 13 cases Hardware, 25 boxes Hardware.
By Strong & Trowbridge.—1 case Bolts, 2 cases Bolts, 20 cases Axes, 1 case Wire Goods, 2 cases Castings, 4 cases Wringers, 5 cases Tools, 3 cases Lamp Goods, 2 cases Rake-Handles, 2 cases Rivets, 45 kegs Nails, 3 cases Padlocks, &c., 1 case Mangles, 12 cases Traps, 9 cases Tools and Choppers, 6 cases Nails, 1 case Tin-Ware, 1 case Emery-Wheels, 1 package Spirit-Levels.
By R. W. Forbes & Son.—7 packages Hardware, ½ dozen Fish-Rods, 5 cases Shade-Rollers, 1 case Stamped-Ware, 2 cases Meat-Choppers, 9 dozen Lemon-Squeezers, 1 case Shears, 1 case Tin-Ware, 1 case Hardware, 13 dozen Picture-Cord, 6 dozen Pencils, 1½ dozen Carpet-Sweepers, 21 dozen Axes, 15 dozen Mouse-Traps, 2 cases Egg-Beaters, 5 cases Wringers, 8 cases Hardware, 1 case Carriage Trimmings, 117 pounds Carriage Bolts, 314 pounds Rivets, 12 sets Loading-Tools, 3 cases Household-Utensils, 115 pounds Axle-Grease, 9 cases Hardware, 8 cases Perambulators, 2 gross Sad-Irons, 36 sets Rake-Teeth, 10 dozen Hay-Forks, 3 packages Fire-Arms, 1 case Air-Guns, 2 cases Electrical Goods.
By Arkell & Douglas.—7 boxes Tools, 101 bundles Felloes, 38 bundles Shafts, 1 case Castings, 3 cases Axles, 2 boxes Castings, 68 packages Hardware, 1 case Razor-Strops, 60 kegs Nails, 7 cases Tools, 20 cases Handles, 2 cases Hose, 8 cases Bolts, 9 boxes Hardware, 1 box Hardware, 1 case Rakes, 12 cases Handles, 3 cases Rakes, 59 cases Tools, 6 cases Wringers, 2 cases Washers, 37 cases Hardware.

PER BARK ROLAND, AUGUST 17, 1889, FOR PORT NATAL, SOUTH AFRICA.

By Marcial & Co.—64 Plows, 15 cases Plow-Wheels and Cutters, 6 Hand-Carts, 10 dozen Axes, 20 dozen Hatchets, 8 dozen Hammers, 19 dozen Wrenches, 10 Meat-Choppers, 12 sets Sad-Irons, 4 gross Chisels and Files, 3 dozen Iron Braces, 2 dozen Chisels, 6 dozen Dividers, 22 dozen Bits, 9 gross Cotton Lines, 12 dozen Razors, 26 dozen Twist Drills, 4½ dozen Planes, 1 dozen Braces, 1 dozen Wagon Jacks, 15 crates Washing-Machines, 4500 pounds Cut Nails, 21 cases Wood Handles, 150 Plow-Shares, 100 Plow-Wheels, 12 Braces, 33 Saws, 4 dozen Saws, 7½ dozen Saws, 6 dozen Knives, 2¾ dozen Saws, 2¾ pounds Plumbs and Levels, 30 dozen Saws, 12 Pairs Carriage Axles, 16 pairs Carriage Axles, 10 pairs Carriage Springs, 10 pairs Carriage Axles, 1 1-6 dozen Carriage Steps, 8 pairs Carriage Springs, 3 pairs Carriage Axles, 2300 Tire Bolts, 4700 Tire Bolts, 3 dozen Handled Axes, 5 dozen Handled Axes, 16 dozen Handled Picks, 3 dozen Wrenches, 12 Scales, 2 dozen Hand-Screws, 3 dozen Braces, 2 dozen Bench-Screws, 6 sets Bits, 4 sets Chisels, 2 gross White Chalk, 1 gross Red Chalk, 21 dozen Basting-Spoons, 1 gross Carpenters' Pencils, 3 dozen Chalk-Line Reels, 6 dozen Screw-Clamps, ⅛ dozen Plumb-Bobs, 38 dozen Padlocks, 12 dozen Crate-Hasps, 3 dozen Hinge-Hasps, 24 dozen Can-Openers, 2 dozen Rack-Hooks, 3 dozen Plumb-Bobs, ¼ dozen Sausage-Stuffers, 2½ dozen Brackets, 2 gross Picture-Nails, 2½ dozen Brackets, 2 dozen Wrenches, 5 dozen Pulleys, 5 sets Iron Sheaves, 2½ gross Drawer-Pulls, 6 gross Hat and Coat Hooks, 2½ dozen Door-Handles, 3 gross Screw-Cases, 1 gross Coat and Hat Hooks, 2 gross Wardrobe-Hooks, 10 dozen Chandelier-Hooks, 3 dozen Lifting-Pulleys, 2 dozen Paper-Weights, 9 dozen Lifts, 1 dozen Screw-Eyes.
By Woodhouse & Stortz.—914 pounds School-Slates, 2170 pounds Agricultural Implements, 73 dozen Edge Tools.
By W. H. Crossman & Bro.—½ dozen Step-Ladders, 6 Scrapers, 1 dozen Churns, 1 dozen Carpenters' Tools, 1 Carriage, 1½ dozen Shellers and Parts, 4 dozen Step-Ladders, 32 crates and 24 boxes Stove Parts, 1 dozen Lawn-Mowers, 2 dozen Washing-Machines.
By Coombs, Crosby & Eddy.—3 dozen Tools, 12 dozen Tools, 810 pounds Scales.
By Corner Bros. & Co.—125 cases Hardware.
By H. W. Peabody & Co.—5 packages Plows, 6 crates Grindstones, 1720 pounds Nails, 120 dozen Handles, 10 packages Carriage-Ware, 34 packages Hardware, 3 crates Corn-Shellers, 2000 pounds Nails.

PER BARK SERENE, AUGUST 21, 1889, FOR PORT NATAL, SOUTH AFRICA.

By Corner Bros. & Co.—30 cases Hardware, 1 case Tools, 42 cases Tools, 90 kegs Horse-shoes, 45 cases Tools, 3 dozen Axle-Grease, 147 packages Agricultural Implements, 78,400 pounds Wire.

PER BRIG GLENORCHY, AUGUST 19, 1889, FOR EAST LONDON, SOUTH AFRICA.

By E. Kuhe.—38 cases Plows.
By R. W. Forbes & Son.—5 reams Sand-Paper, 18 dozen Spades, 41 kegs Nails, 2 boxes Shade-Rollers, 35 dozen Axes, 13 sets Axles.
By Coombs, Crosby & Eddy.—8 Carriages, 32 dozen Hardware, 28¼ dozen Hardware.
By J. Norton & Sons.—18 dozen Wrenches, 10 dozen Axes, 30 dozen Hatchets, 9 cases Plows, 38 cases Plows, 6 dozen Hay-Forks, 50 dozen Axe-Handles, 100 dozen Pick-Handles.
By W. H. Crossman & Bro.—7 cases Lamp Goods, 20 dozen Tools, 3 cases Hardware, 1908 pounds Jute Rope, 2150 pounds Sash-Weights, 127 pounds Sash-Cord, 20 dozen Tools, 50 pounds Horseshoe Nails, 163 cases Plow Parts, 5 Dam Scrapers, ⅛ dozen Stor Trucks, 1650 pounds Sash-Weights, 10 pounds Sash-Cord, 127 cases Plow Parts, Dam Scrapers.
By Arkell & Douglas.—1 case Drilling Machinery, 11 dozen Axes, 3 dozen Hatchets, 9

Ranges, 4 dozen Rakes, 1 dozen Axles, 8 dozen Plows, 40 dozen Axes, 274 Plows and Parts, 2 gross Hardware, 1 Plane, 2 gross Hardware, 1 case Hardware, 1 dozen Hardware, 9 dozen Axes, 2 dozen Hatchets, 6 dozen Axes, 6½ gross Hardware, 2⅝ gross Fruit Jars, 2⅝ gross Jar Fittings, 5 dozen Rakes, 22 dozen Granite-Ware, 4 gross Hardware.

PER BARK JUSTINE H. INGERSOLL, AUGUST 21, 1889, FOR CAPE TOWN, SOUTH AFRICA.

By Arkell & Douglas.—100 sets Hubs, 2 gross Axle-Grease, 2½ dozen Hardware, 12 dozen Axes, 3⅛ gross Axle-Grease, 4 gross Shade-Rollers.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Animal and Vegetable Oils.

There have been no striking developments in this branch of trade. In fact, the general situation is practically the same at this time as it was a week ago. The position of the Seed market makes it somewhat doubtful that the expected general reduction in prices of Linseed-Oil will be realized this month, but the rather disturbing influence of an unsettled Lard market, along with the prevailing uncertainties in other particulars, still has an unfavorable bearing upon Lard-Oil and Linseed Oil. The catch of fish on the New England coast indicates a continued liberal supply of Menhaden-Oil, and this, in turn, has a bearing upon Sperm and Whale products. Cocoanut, Olive and Palm Oils are still governed chiefly by reports from primary markets, which for the time being favor firm prices.

Linseed-Oil.—The movement has been somewhat freer and the market is steadier, being toned up in some degree by knowledge of the fact that the position of the Seed market is against cheaper Oil right away. City Raw stands at 60¢, and for out-of-town makers about 57¢ seem now to be bottom figures.

Lard-Oil.—Pressers are turning out Oil only as the current demand necessitates, in view of the peculiar position of the market for raw material and the poor outlet for Stearine. The best brands of present-make prime are held at 53¢ for prompt delivery, but orders for 100-barrel lots, delivery ahead, would doubtless be taken at 1¢ @ 2¢ less.

Cotton-Seed-Oil.—Between 300 and 400 barrels of "off" grade Summer Yellow have been disposed of at 40¢ @ 43¢. Apart from this no business is reported and the market remains in an unsettled condition pending developments regarding new-season product. With respect to what may be going on in the latter connection sellers are very reticent. The appearances are that 35¢ for crude and 40¢ for Summer Yellow are close to the trading basis.

Menhaden-Oil.—Crude is in plentiful supply at the East, and the offerings here are quite ample for the demand. Buyers experience no difficulty supplying their wants at 22¢ @ 23¢. Pressed and Bleached Menhaden and Tanners' Oils remain steady.

Sperm and Whale Oils.—There has been no change whatever in this line, the general demand being merely fair and met at previous prices.

Cocoanut-Oils on the spot are quite firm, with supplies under close control, and both Ceylon and Cochin for future delivery are held higher, owing to advices of enhanced cost in the foreign markets.

Palm and Olive Oils remain firm, and are selling fairly in jobbing lots.

Tallow-Oil has declined about 2¢ ℔ gallon and is slow of sale.

Paints and Colors.

There has been a very good Southern demand for several lines of the more staple class of goods and about the ordinary run of orders from other sources. All told the distribution makes a fairly-good showing and the market, with remote exceptions, retains a steady tone. Chalk in bulk has depreciated to an unusually low point under the weight of excessive supplies and some pressure to sell, having sold at as low as $1.50 ℔ ton. This low cost of the crude material has operated to cause freer competition in common Whiting, sales of which have been made at as low as 30¢ ℔ 100 lb. Apart from the cases cited there has been no important changes, however, and for Leads, Zincs and the leading Colors values keep remarkably free from fluctuation.

White Lead, &c.—Corroders report a somewhat freer movement of White Lead on local purchases, and orders from near-by out-of-town points. Outside competition does not appear to be disturbing the "trust," and prices, therefore, are kept unchanged. Red Lead, Litharge and Orange Mineral are selling in about the routine way to a very fair extent.

Zincs.—There has been a very steady demand for American Oxide Zinc. Orders run chiefly on small lots, but the distribution is quite on a level with the supply. The situation is thus favorable, and assisted more or less by the high cost of foreign Zinc, but manufacturers fail as yet to secure any advance on previous prices. French and German are very firmly held at last week's advance.

Colors.—The leading descriptions of dry colors have met with very steady sale, moving more freely in some instances this week than last. Prices stand without quotable change, and the market, as a whole, preserves a very good tone. Colors in Oil have been moving fairly and in ready-mixed Paints a freer trade is generally reported.

Miscellaneous.—A line of 3000 tons Chalk, in bulk, was disposed of at $1.50 ℔ ton, and additional lots were said to have been sold at the same figures. The price named barely covers the cost for freight and handling. Common Whiting is said to have been sold at 30¢ @ 35¢, in round lots, against 40¢, the prices generally quoted as "inside." The movement of the article has been quite brisk. Paris White has met with very good sale at fairly steady prices. There is nothing new in Clays of any description.

Wholesale Prices.

NEW YORK, September 3, 1889.

Animal and Vegetable Oils.

Linseed, City, raw	per gal	60 @	..
" boiled		63 @	..
" Western, raw		57 @	58
Lard, City, Extra Winter		54 @	55
" " Prime, present make		52 @	53
" " Extra No. 1		47 @	48
" " No. 1		42 @	44
" Western, prime		51 @	53
Cotton-seed, Crude, prime		34 @	35
" " off grades		30 @	33
" Summer Yellow, prime		45 @	47
" " off grades		40 @	43
Sperm, Crude		61 @	62
" Natural Spring		67 @	68
" Bleached Spring		72 @	73
" Natural Winter		74 @	75
" Bleached Winter		80 @	..
Whale, Crude		37 @	40
" Natural Winter		45 @	46
" Bleached Winter		47 @	48
" Extra Bleached		49 @	50
Sea Elephant, Bleached Winter		54 @	55
Menhaden, Crude, Sound		22 @	24
" Crude, Southern		22 @	23
" Light Pressed		28 @	29
" Bleached Winter		34 @	..
" Extra Bleached		38 @	39
Tallow, City, prime		.. @	48
" Western, prime		.. @	47
Cocoanut, Ceylon		.. @	5⅝
" Cochin		6¾ @	7¼
Cod, Domestic		30 @	32
" Foreign		34 @	35
Red Elaine		36 @	38
Red Saponified	℔ lb	4¾ @	5
Bank	per gal	26 @	27
Straits		27 @	28
Olive, Italian, bbls		69 @	71
Neatsfoot, prime		62½ @	75
Palm, prime, Lagos	℔ lb	5⅛ @	5¼

Mineral Oils.

Black, 29 gravity, 25 @ 30 cold test, per gal		8 @	9
" " 15 " "		8½ @	9½
" " summer		6 @	7
Cylinder, light, filtered		15 @	20
" dark, "		14 @	20
" " steam refined		10 @	18
Paraffine, 23½ @ 24 gravity		11 @	12
" 25 "		10 @	11
" 28 "		8½ @	9
" red, 21 @ 22 gravity		14 @	14½
" " 22½ @ 23 "		12 @	13

Paints and Colors.

Barytes, Prime White	℔ ton.	$21.00	
" American Refined		18.00 @	20.00
" " No. 1		16.00 @	17.00
" " No. 2		14.00 @	15.00
" " off-color		12.00 @	.....
Blue, Celestial	℔ lb	5½ @	7½
" Chinese		45 @	50
" Prussian		20 @	35
" Ultramarine		7 @	25
Brown, Spanish		¼ @	1
" Vandyke, American		3 @	3½
" " English		6 @	8
Black, American Drop		8 @	10
" English "		12 @	14
" Frankfort "		5 @	18
Black, Lamp, common		12 @	18
" " medium		19 @	25
" " prime		27 @	33
Carmine, No. 40, in bulk		3.10 @	..
" " in boxes or barrels		3.20 @	..
" " in ounce bottles		4.20 @	..
Chalk, in bulk	℔ ton.	2.00 @	2.50
" in bbls	℔ 100 lb	30 @	40
China Clay, English	℔ ton.	13.50 @	18
" Southern		10.00 @	11.50
Cobalt Oxide, prep'd		2.90 @	..
" " black....lots 100 lb		2.60 @	..
" " .....less "		2.65 @	..
Crocus Martus, English	℔ lb.	1½ @	2½
" American		1½ @	2½
Green, Paris, in bulk		20 @	..
" " 170 @ 175 lb kegs		20½ @	..
" " small packages		22 @	26½
" Chrome, ordinary		8 @	11
" " extra		12 @	13
" " pure		22 @	25

REBATES, &c.—Paris Green.—Rebates to buyers of 500 to 1000 lb during season, ½¢ ℔ lb; to buyers of 1000 to 2000 lb, 1¢; to buyers of 2000 to 4000 lb, 1½¢; to buyers of 4000 to 10,000 lb, 2¢, to buyers of 10,000 lb and over 2½¢. Buyers of 5 tons or over at one time receive an additional ¼¢ ℔ lb.

Lead, American White, dry		6¾ @	7
" " in oil		7 @	7¼
" " Red		6¾ @	7
Litharge, in barrels		6¼ @	.
" " 500-lb lots		7 @	..
" " smaller "		7¼ @	..

REBATES, &c.—White Lead ½¢ ℔ lb rebate on purchases of 500 lb and over, if paid for within 60 days of date of invoice; terms, 60 days or a discount of 2½ % if payment within 15 days from date of invoice. Extra rebate of ½¢ ℔ lb, payable July 1 and December 31 to buyers of a total of 10 tons pure Lead during the year.

Litharge.—Rebate of ½¢ ℔ lb for cash in 60 days and 2½ % additional for cash in 15 days.

Ocher, Rochelle		1.35 @	1½
" French Washed		1½ @	2½
" German Washed		1¼ @	3
" American		½ @	1¼
Orange Mineral, English		8½ @	9½
" French		9 @	9¾
" German		8½ @	9½
" American		8 @	8½
Paris White, English Cliffstone		90 @	1.10
" American		70 @	80
Red, Indian, English		5½ @	7
" " American		2 @	6
" Turkey		9 @	14
" Tuscan		9 @	11
" Venetian, American	℔ 100 lb.	90 @	1.25
" English		1.00 @	1.45
Sienna, Italian, Burnt and Powd.	℔ lb	5 @	6½
" " burnt Lumps		1½ @	3½
" " Raw, Powdered		5 @	6½
" " " Lumps		2 @	3½
" American, Raw		1½ @	1¾
" " Burnt and Powdered		1½ @	1¾
Talc, French		1¼ @	1½
" American		1 @	1¼
Terra Alba, French	per 100 lb	72½ @	80
" " English		80 @	85
" " American No. 1		70 @	75
" " American No. 2		38 @	40
Umber, Turkey, Bnt. and Powd.,	℔ lb	3½ @	4
" " Burnt, Lumps		2¾ @	3
" " Raw and Powdered		3¼ @	4
" " Raw, Lumps		2½ @	2¾
" " Burnt, American		1½ @	1½
" " Raw, "		1¼ @	1½
Yellow, Chrome		10 @	25
Vermilion, American, Lead		11½ @	13
" Quicksilver		65 @	70
" English Imported		82 @	85
" Imitation English		8 @	25
" Trieste		75 @	77
" Chinese		88 @	90
Whiting, Common	℔ 100 lb	40 @	45
" Gilders'		55 @	65
Zinc, American, dry	℔ lb	4¼ @	4¾
" French, Red Seal		.. @	7¾
" " Green Seal		.. @	7¾
" " V. M. X		6 @	6¼
" Antwerp, Red Seal		.. @	7
" " Green Seal		.. @	7¼
" German, L. Z. O		.. @	6
" V. M. in Poppy Oil, G. Seal, lots of 1 ton and over		10 @	10½
lots less than 1 ton		10¼ @	10¾
Zinc, V. M. in Poppy Oil, Red Seal, lots of 1 ton and over		.. @	..
		9¾ @	9¾
Lots of less than 1 ton		9¾ @	10

DISCOUNTS.—French Zinc.—Discounts to buyers of 10-bbl. lots of one or assorted grades, 1 %; 25 bbls, 2 %, 50 bbls, 4 %. No discount allowed on less than bbl. lots.

Colors in Oil.

Blue, Chinese	℔ lb	35 @	40
" Prussian		20 @	45
" Ultramarine		12 @	18
Brown, Vandyke		7 @	12
Green, Chrome		8 @	13
" Paris		16 @	18½
Sienna, Raw		7 @	13
" Burnt		7 @	13
Umber, Raw		7 @	10
" Burnt		7 @	10

Glue.

Low Grade	℔ lb	8 @	10
Cabinet		12 @	14
Medium White		13 @	15
Extra "		17 @	20
French		9 @	20
English		10 @	15
Irish		12 @	15

The Crabbs Chuck.

The construction of this chuck is made plain in the perspective view, part of which is cut away to show the interior. The grasping jaws of the chuck are designed to grip the sockets shown in Figs. 2, 3 and 4. The tools are held in the chuck by turning the shell just enough to

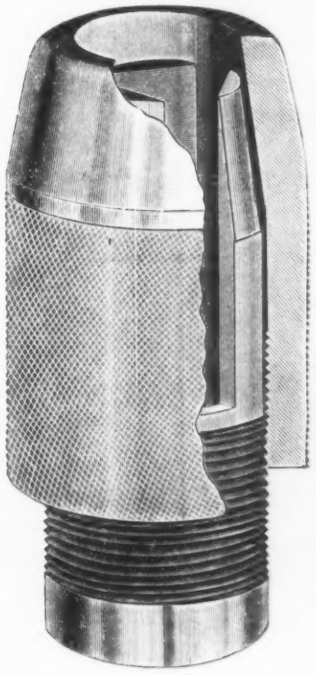


Fig. 1.—The Crabbs Chuck.

prevent the socket from dumping out. Therefore no power other than the hand is required. The manufacturers of this chuck, the Great Western Pin Company, of Toledo, Ohio, make 25 sizes of the split sockets for broken drills, beginning with ¼ inch up to and including ½ inch by

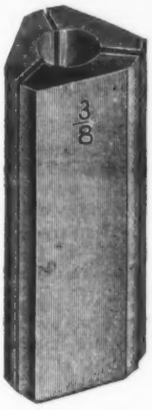


Fig. 2.—Broken.

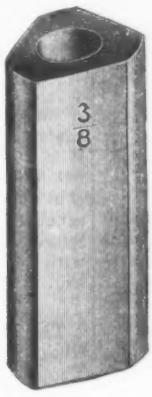


Fig. 3.—Straight.

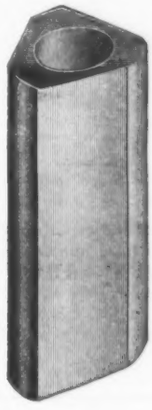
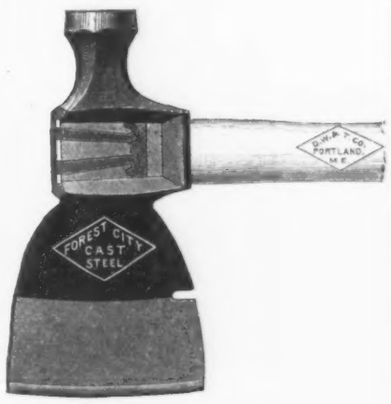


Fig. 4.—Taper.

64ths. The drill is pushed into the socket so that the pin enters the groove of the drill, when the drill is turned till it strikes the bottom of the socket. For straight-shank drills sockets are provided having a taper thread in the bottom. These are the same number and size as the broken drill socket. The bottom of the socket is tapped tapering and hardened, and when the drill is inserted in the socket and brought into use it will cut its own thread on the soft shank of the drill and hold it securely until the drill is worn out and it becomes necessary to replace it with another. The socket with taper hole is designed for taper-shank drills. The flat end of the drill-shank sticks through the socket far enough for a slight blow to remove the drill in order that another size may be put in. This chuck is intended especially for holding any tool that must not slip during use.

Clinch for Hammers and Hatchets.

The Diamond Wrench and Tool Company, Portland, Maine, have adopted a new method of securing the handles in their hammers and hatchets. It is illustrated in the accompanying cut, one side



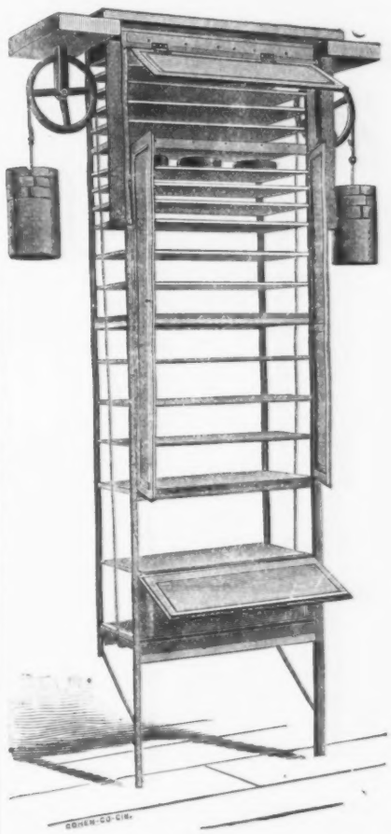
Clinch for Hammers, Hatchets, &c.

of the head being cut away to show the mechanism by which the wedges are clinched and the handles locked into the eye of the tool. The wedges are described as made of the same width as the eye of the tool in which they are to be used, and have shoulders which fit into recesses in the eye of the hammer or hatchet, and when driven in the points strike the piece of steel that has been driven through the handle, and, following the curves, clinch in such a manner, it is claimed, that it is impossible for the handle to come out or work loose. This principle is also embodied in the screw-drivers made by the above firm.

An inventive genius in Rome, Ga., has constructed a little machine that he calls the "chicken-walker." It proposes to do away with the fences around gardens and protect the gardens from damage by chickens. When the machinery is placed on a chicken's feet and the fowl goes in the garden and makes an effort to scratch the soil, instead of accomplishing its desire the attachment walks the chicken out of the garden; the harder it scratches the faster it goes. The only trouble is that when the machine runs down it may be difficult to catch the chicken.

Wright's Patent Vertical Movable Kitchen Safe.

The C. B. McHenry Company, Aurora, Ind., are just placing upon the market the apparatus shown in the accompanying illustration. It is designed as a conveyance for articles of food usually kept in the cellar or basement away from the kitchen or dining-room, and allowed to remain there until required, thus serving as a substitute for the ordinary house-safe. There is no frame-work or obstruction of any kind above the floor, the top of the apparatus forming part of the floor in the room above, which may be covered with a rug in case the latter is carpeted, making it perceptible only when in actual use. The apparatus is constructed wholly of metal, with the exception of the shelves and the top. The makers state that there is no liability of its becoming out of order, and

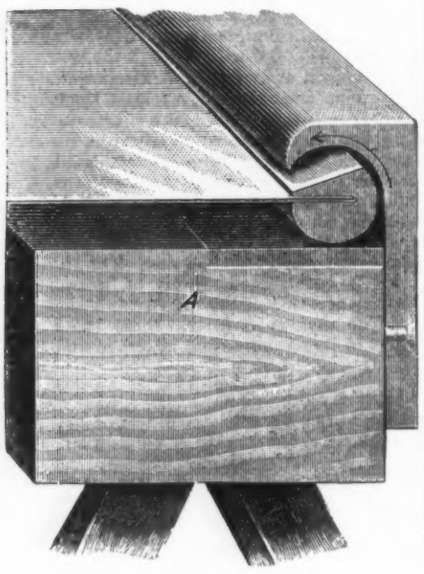


Wright's Vertical Movable Kitchen Safe.

being constructed of the material mentioned it will not bind nor swell or be affected by changes in atmosphere or dampness. Its balance adjustment is made from above, should the apparatus and load to be carried vary in weight, by means of the removable weight, shown at the side of the apparatus in the illustration. The apparatus can be placed in position in any part of the room desired, and it will work equally as well before as back of a door. The apparatus being counterbalanced, when required in the kitchen or dining-room pressure on a spring at once releases it, when it quickly ascends. After the articles required have been removed it is again readily lowered into the cellar. Four sizes are at present being regularly made, ranging in capacity from 60 to 300 pounds; special sizes are made to order. It is also pointed out by the manufacturers that this safe may be used as a dumb-waiter if desired.

German Machine for Double-Locking.

Much of the zinc and copper roofing done in Continental Europe is laid with a double-cross lock, a feature which, to a limited extent, has been introduced in this country for tin-work. A number of devices are in use in different parts of Europe for producing a double-cross lock in an economical manner. Fig. 1 of the accompanying illustrations presents a general view of a device recently brought out for purposes of this kind by E. J. Fischer, of Dittersdorf, Chemnitz, Germany. The device in some regards resembles machines in use in this country, but differs from them in a number of essential particulars. It may be described as a form of the beading-machine using a splined rod. Unlike the beading-rod, however, one side of the rod is shaped so as to form a sharp angle where the metal enters. The rod is worked in a space between a flat plate and an overhanging hood and the metal is entered as shown in Fig. 1. The rod is revolved, producing successively the shapes shown at B, C and D in Fig. 2. This leaves the metal in the form indicated in Fig. 3 by E F. The latter figure also shows how adjacent sheets are hooked together, while Fig. 4 shows the several layers of metal after the parts have been brought in close contact by malleting.



German Machine for Double-Locking.—Fig. 1.—Perspective View of End of Machine for Forming Double-Cross Locks.

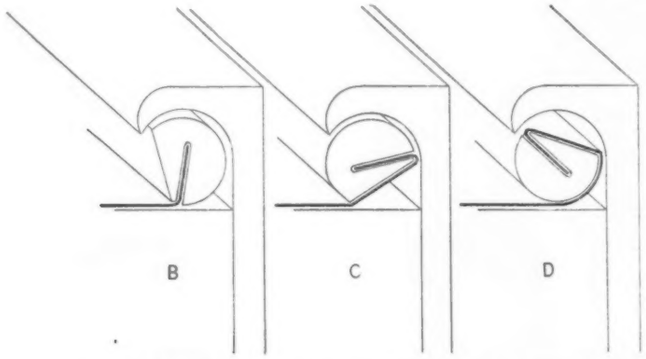


Fig. 2.—End Views of Machine, Showing Successive Steps in Forming the Locks.

Fig. 3.—Profile of Sheet with Double Locks Turned, Showing Manner of Hooking.

Fig. 4.—The Resulting Seam with the Parts Malleted Down.

Standard Rim-Spring Sash-Lock.

This sash-lock is made by the Yale & Towne Mfg. Company, Stamford, Conn., and 62 Reade street, New York. It is to be observed that it is in fact a *lock* by means of which the window is securely fastened. From an inspection of Fig. 1 of the cuts it will be seen to consist of a spring bolt engaging with a keeper placed at any desired point on the window-casing, and has a lock by means of which it can when desired be fastened securely against opening until it has been unlocked. It is obvious that security which does not attend the use of other sash fasts is thus obtained, and its convenience and the excellence of the mechanism are also referred to. The sash-lock is furnished with nickel-plated steel keys as shown in Fig. 2 of the illustrations.

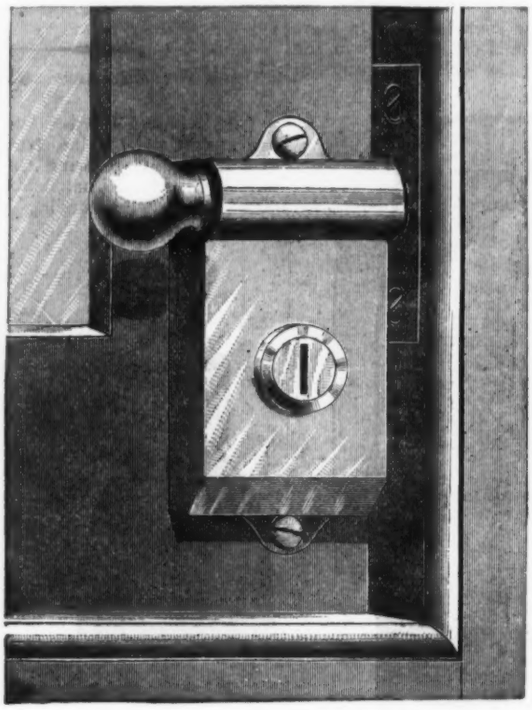


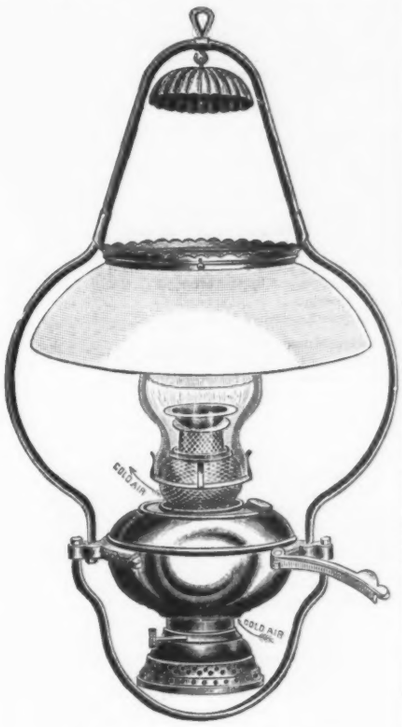
Fig. 1.—Standard Rim-Spring Sash-Lock.

Fig. 2.—Key of Lock.

The new Red Star steamer launched at Glasgow from the yard of the Messrs. Thomas is described as follows: Length over all, 450 feet; breadth, 51 feet 3 inches, and depth molded, 38; with a gross tonnage of 6700 tons. She is built of Siemens-Martin steel. Internally she is divided by nine bulkheads and the doors are placed 8 feet above the load water-line, so that there can be no possibility of water finding its way from one compartment to another. The propelling machinery is of the triple-expansion type, having cylinders 35½ inches, 56 inches and 89 inches in diameter respectively, and adapted to a stroke of 4 feet 6 inches. Steam is supplied by three double and one single ended boiler, having 21 furnaces, with Purves' ribbed flues and Henderson's patent bars. The boilers are worked under forced draft on the closed stoke-hold system, and the working pressure is 160 pounds to the square inch.

The A. & W. Arc Safety Lamp.

The Adams & Westlake Company, of 110 Ontario street, Chicago, are introducing to the trade a safety lamp known as the A. & W. Arc, which is especially adapted for lighting large areas, such as railroad stations, factories, stores, shops, churches, halls and the like. This lamp is claimed to be non-explosive, can be used in any place, and burned high or low, as may be desired. The wick-tube and wick extend entirely through the lamp, and are separated from the body of the oil by an air-space which tends to keep the oil cool. The construction is such that the burning wick or flame cannot be turned or dropped into the oil reservoir, thus removing all danger. The statement is made that the flame can be turned high without creeping up, or low without danger of coming

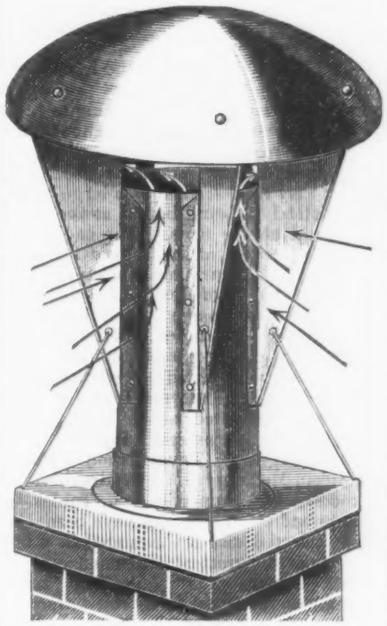


The A. & W. Arc Safety Lamp.

in contact with the oil. As the latter remains cool no gas is generated. The wick is of good length and is operated from the bottom. A half turn will adjust or extinguish the flame without disarranging the wick. The fount or body of the lamp may be removed or replaced through an inch opening in the harp ring, all of which is clearly shown in the illustration. This construction prevents the fount from dropping out, as is possible in lamps where the founts are held in position by springs, keys, notches, or pins. The manufacturers claim that the lamp does not sweat, drip, smoke, heat nor smell, and that it gives more light than four or five ordinary lamps, and is economical in other respects.

Ryder's Balloon Chimney-Cap and Ventilator.

The accompanying illustration shows an improved draft-cap and ventilator which has lately been brought out by E. P. Ryder, of Riverhead, Long Island, N. Y. The device is designed for use in connection with smoky chimneys, smoke-stacks, &c., and may be employed on deck irons of vessels. It consists, as may be seen from an inspection of the cut, of a section of pipe which forms a continuation of the chimney or smoke-stack in connection with which it is used. It is provided with wings so disposed as to stand radially upon the outer walls of the pipe at a point some distance above its upper end, these wings increasing in width from the bottom upward, so that the

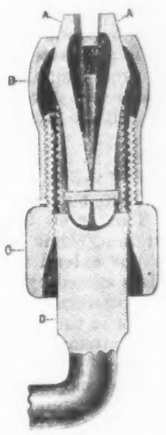


Ryder's Balloon Chimney-Cap and Ventilator.

greatest width is above the top of the flue. The inventor claims that the construction is such as to concentrate the volume of air over the flue top, giving very satisfactory results. The device, we are informed, has been thoroughly tested, and has demonstrated its ability to perform the work claimed for it.

Differential-Thread Bit-Holder.

The device shown in the accompanying engraving was patented June 18, 1889, and is put upon the market by H. S. Bartholomew, Bristol, Conn. D is the brace, slotted to hold the jaws, on which is cut a 12 thread; A the jaws set in the slot in the socket; C the inner part of the



Differential-Thread Bit Holder.

shell which screws on the brace, having a 12 thread cut on the inner side and a 13 thread cut on the outer side; B a shell with a 13 thread cut on the inner side to screw on to C. The bit is put into the jaws and the shell screwed down on the brace until B comes in contact with the jaws, when it stops revolving and C continues to screw down on to D and unscrew out of B, so that every turn of D draws B down $\frac{1}{156}$ inch, making B grip the jaws very hard and firm. Mr. Bartholomew has incorporated this construction in the braces for which it is adapted and claims that by its use a gripping-power of 156 to 1 on the jaws, less the friction, is obtained.

Stamped Sheet-Metal Goods.

We present by means of the accompanying illustrations views of some of the new seamless straight stamped goods

Stamped Sheet-Metal Goods.—Fig. 1.—Seamless Marking-Cup.

which are being offered the trade by Sidney Shepard & Co., of the Buffalo Stamping Works, Buffalo, N. Y. These goods are carefully made in every respect, particular attention being given to the different processes through which they pass and to their finish and durability. Fig. 1 of the illustrations shows a

Fig. 2.—Seamless Cup.

seamless marking or spit cup made of plain tin, and which measures 4⅛ x 3 inches in size. Fig. 2 shows one style of seamless straight cup, which is made both plain and retinned. In size it measures 4 x 2¾ inches. In Fig. 3 is represented another variety of straight cup, but of greater

Fig. 3.—Seamless Straight Cup, Extra Depth.

depth than the diameter. This is a novelty in stamped sheet-metal goods, and is offered in two styles of finish. Fig. 4 of the engravings shows a seamless covered saucepan, which is made in ten sizes,

Fig. 4.—Seamless Covered Saucepan.

ranging from half a pint to four quarts. The manufacturers take much pride in this line of goods, as they consider it marks a new era in the stamping of sheet-metal ware.

NEW PUBLICATIONS.

STEAM BOILERS; THEIR MANAGEMENT AND WORKING ON LAND AND SEA. By James Peattie. E. & F. N. Spon, London and New York.

The writer very sensibly leaves the history of the steam-boiler alone, and deals solely with the boiler as a production. He divides boilers into three general kinds—namely, those externally heated, internally heated and both. The first part of the book considers the question of combustion, beginning with the combustion of coal, the gases produced and the temperatures and efficiency reached. This branch naturally includes the discussion of those losses due to the escape of a part of the heat of the coal before reaching the water in the boiler. The generation of steam and the questions affecting it next follow. Then come various analyses of water and the influence on boilers by its chemical composition. The character of the scale deposited and the methods tending to relieve it are fully treated. The subject of latent heat is treated in a way which makes the meaning of the author extremely plain. The handling of the boiler from the admission of water and the starting of the fire is treated in a practical way. The final pages of the book are devoted to explosions from gases and the safeguards used.

THE CRANK; ITS MOTION AND TRUE VALUE FOR THE TRANSMISSION OF POWER IN PRACTICAL ENGINEERING. By F. Lenggenhanger, Ph.D. D. Van Nostrand Company, New York. Illustrated. Price, $1.50.

The object of this book is to ascertain the exact percentage of power obtained by the use of the crank, or, in other words, if a power of 1000 foot-pounds is delivered by the piston, what part of this power is imparted to the driving-belt. The first operation is the consideration of the crank itself and its relation to the piston, and following this the discussion of the power developed by the crank. As an important factor in the problem the duty performed by the fly-wheel is considered in its relation both to crank and piston. The work is of value as presenting much original matter concerning the work performed by the crank.

STEAM-ENGINE DESIGN By Jay M. Whitham, Professor of Engineering, Arkansas Industrial University; 210 illustrations. John Wiley & Sons, New York. Price, $6.

This book is intended for the use of mechanical engineers, students and draftsmen, and treats of the application of the principles of mechanics to the design of the parts of a steam-engine of any type or for any duty. Auxiliary attachments and construction details are very fully discussed and illustrated by numerous drawings. The work begins with a discussion of the cylinder, piston area, piston-head for a non-compound engine, considers the design of slide-valves, valve and reversing gears, steam-chest, &c. The kinds of compound and triple-expansion engines are defined, and the theory of the action of the steam in them is elucidated, together with the theoretical indicator diagrams of the compound engine. This is followed by diagrams showing the crank effort, and illustrating the influence of the reciprocating and rotative parts of an engine. Friction and the part it plays in the engine is fully considered in all its aspects. The design of the piston-rod, cross-head and guide, the connecting-rod, crank-pin, crank-arms, line and propellor shafts, bearings, couplings, &c., necessarily form a large and important item in the book. The same is true of condensers and pumps. The auxiliary parts of the engine, such as foundations, &c., are thoroughly treated. The final chapter is devoted to the theory of the propellor paddle-wheel, feathering paddle-wheel, and the power to be derived from them. The illustrations throughout the book are well drawn, and add greatly to the value of the work.

A MANUAL OF MACHINE CONSTRUCTION FOR ENGINEERS, DRAFTSMEN AND MECHANICS. By John Richards. J. B. Lippincott & Co. 1889. Price $5.

This latest addition to the literature of machine construction by a well-known practical writer is a book unique in its way, with peculiarities that cannot fail to strike the reader. In the first place, it is bound differently from most books. In size it may be described as a large octavo, but instead of being bound at the side it is bound at the ends. The paging and running head is at the bottom instead of at the top. The volume consists of a little over 150 pages of text, with about the same number of pages bound blank with faint rulings for notes and memoranda. Accordingly it becomes a volume in which an engineer's recorded experience can be readily noted. The work is comprised in six sections devoted to the following subdivisions of the general subject: 1, Machine Design. 2, Transmission of Power. 3, Steam Machinery. 4, Hydraulics. 5, Processes and Properties. 6, Tables and Memoranda. The tables have been carefully selected and are arranged in a form to be of the greatest convenience to the practical man. The following extracts from general remarks by the author will give a conception of the general scheme of the book. After asserting that physics, dynamics, hydraulics and all branches of physical science rest upon mathematical bases not easily disturbed by short methods, and that constructive processes, arrangements and proportions of machine parts cannot make such claim, and perhaps never will make such claim, the author continues:

"The writer once supposed and ventured to claim that these things could be made amenable to exact or measurably exact rules. This opinion has been abandoned for a belief that special knowledge and experience must remain the greater part, and books, references and rules can deal only in a limited way with constructive engineering. This view has been further confirmed by observing the influence of what is called technical training in this and other countries. Colleges and schools of the kind have had a marvelous effect in Germany during the 40 years past, but not in the manner commonly supposed. The theoretical part or foundation of skilled industry was thus provided, but the processes and implements come mainly from England and this country. At the present day wages have risen on the Continent of Europe to only one-half as much as in England or one-third as much as in this country, still the labor cost of skilled production is seldom less. The non-computable part is wanting. This is no disparagement of technical training, but shows that its effect does not extend to the completed product. It is exceedingly difficult to define the line between what is computable and what is not in the construction of machinery. The attempt is made in the following remarks, which are suggestive rather than final, and are included because essential to a full understanding of what is to follow."

Respecting the operation of the Interstate Commerce law and Judge Cooley's condemnation of the managers of the Northwestern railroads, a careful observer says the root of the difficulty is in the act of Congress itself in interfering with the natural channels of traffic: "The struggle between the different Northwestern railroads has been partly caused and in all respects greatly aggravated by forces which the act has brought into operation. Because of the new conditions under which the act required domestic traffic to be conducted many new competing lines were built and have gone into operation fighting for existence. Because of the restraint to which American lines were subjected the Canadian roads were encouraged to place themselves in position to compete and do now compete sharply for a vast amount of traffic which they formerly did not seek."

It is reported that the Morris Mining Company, of Birmingham, Ala., have closed a contract with the Louisville and Nashville Railroad for the shipment of 1,000,000 tons of ore during the next year.

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CURRENT HARDWARE PRICES.

SEPTEMBER 4, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Ammunition.—

Caps, Percussion, ℔ 1000—

Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....34@35¢
E. B. Trimmed Edge, 1-10's.....46@48¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....46@47¢
Musket Waterproof, 1-10's.....50¢
G. D.....28¢
S. B. Genuine Imported.....45¢
Eley's E. B.....54¢ @ 55¢
Eley's D Waterproof, Central Fire...$1.60

Cartridges.

Rim Fire Cartridges.....50&5&2 %
Rim Fire Military.....15&2 %
Cent. Fire, Pistol and Rifle.....25&5&2 %
Cent. Fire, Military and Sporting 15&5&2 %
Blank Cartridges, except 22 and 32 cal., additional 10 % on above discounts.
Blank Cartridges, 22 cal., $1.75.....2 %
Blank Cartridges, 32 cal., $3.50.....2 %
Primed Shells and Bullets.....15&5&2 %
B. B. Caps, Round Ball, $1.75.....2 %
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Primers—

Berdan Primers, $1.00.....2%
B. L. Caps (for Sturtevant Shells) $1.00, 2%
All other Primers, $1.20.....2%

Shells—

First quality, 4, 8, 10 and 12 gauge 25&10&2%
First quality, 14, 16 and 20 gauge ($10 list).....30&10&2%
Star, Club, Rival and Climax brands, 20&10&2%
Seibold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax.. 65&2%
I X L, 10 and 12 guage.....40&5&2%
"Special," 16 gauge.....30&10&5&2%
"Special," 10 and 12 gauge.....40&10&2%
Fowler's Pat.....$3.25

Shells Loaded—

Standard. List.....40&10@40&10&10%

Wads—

U. M. C. & W. R. A.—B. E., 11 up..$2.00
U. M. C. & W. R. A.—B. E., 9&10.. 2.30
U. M. C. & W. R. A.—B. E., 7&8... 2.60
U. M. C. & W. R. A.—P. E., 11 up.. 3.10
U. M. C. & W. R. A.—P. E., 9&10.. 4.00
U. M. C. & W. R. A.—P. E., 7&8... 4.90
Eley's B. E., 11 up.....$1.75
Eley's P. E., 11@20.....2.80

Anvils.—

Eagle Anvils, ℔ 10¢..... ...20@20&5%
Peter Wright's.....9½¢@9¾¢
Armitage's Mouse Hole.....8¾¢
Armitage's Mouse Hole, Extra.11¼@11½¢
Trenton.....9¼@9½¢
Wilkinson's.....9½@10¢
J. & Riley Carr, Pat. Solid.....11@11½¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—

Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise, $3.00.....40&10%

Apple Parers—

Advance.....℔ doz $4.75
Antrim Combination.....℔ doz 5.50
Baldwin.....℔ doz 5.25
Champion.....℔ doz 7.25
Daisy.....℔ doz 4.00
Eureka, 1883.....each 17.00
Family Bay State.....℔ doz 12.00
Favorite.....℔ doz 5.00
Gem.....℔ doz 5.25
Gold Medal.....℔ doz 4.00
Ideal.....℔ doz 4.00
Improved Bay State.....℔ doz 30.00
Little Star.....℔ doz 4.50
Monarch.....℔ doz 13.50
New Lightning.....℔ doz 5.50
Oriole.....℔ doz 4.00
Penn.....℔ doz 4.00
Perfection.....℔ doz 4.00
Pomona.....℔ doz 4.00
Rocking Table.....℔ doz 6 00
Turntable.....℔ doz 4.50
Victor.....℔dos 13.50
Waverly.....℔ doz 4.00
White Mountain.....℔ doz 4.50
72.....℔ doz 4.25
76.....℔ doz 5.75
78.....℔ doz. 6.50

Augers and Bits—

Douglass Mfg. Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co. } 70%
French, Swift & Co. (F. H. Beecher,
Rockford Bit Company.

Cook's, Douglass Mfg. Co.....55 %
Cook's, N. H. Copper Co.50&10@50&10&5%
Ives' Circular Lip.....60%
Patent Solid Head.....30%
C. E. Jenning & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ℔ set, 32½ quarters, No. 5, $5; No. 30, $3.50.20%
Lewis' Patent Single Twist.....45%
Russell Jennings' Augers and Bits....25%
Imitation Jennings' Bits.....60@60&5%
Pugh's Black.....20%
Rockford, Jenning's Pattern.....60%
Car Bits.....50&10@60%
L Hommodieu Car Bits.....15&10%
Forstner Pat. Auge Bits.....10%

Hollow Augers—

Ives' } 33⅓ @
French, Swift & Co. } 33⅓&10%
Douglass'
Bonney's Adjustable, ℔ doz $48...40&10%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%

Expansive Bits—

Clarks' small, $18; large, $26...35@35&5%
Ives' No. 4, ℔ doz $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $22.....35%
Stearns' No. 2, $48.....20%

Gimlet Bits—

Common .....℔ gross $2.75@$3.25
Diamond.....℔ doz $1.10.....25&10%
Bee.....25@25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co...30&10%
Double Cut, Hartwell's, ℔ gro.....$5.25
Double Cut, Douglass'.....40&10%
Double Cut, Ives'.....60@60&10%

Bit Stock Drills—

Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Williams' or Holt's, for metal.50&10&10%
Williams' or Holt's, for wood...40&10%

Ship Augers and Bits—

L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's.....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10@5%

Awl Hafts—

Sewing, Brass Fer. ℔ gr, $3.50.....45&10%
Pat. Sewing, Short.$1.00 ℔ doz.....40&10%
Pat. Sewing, Long.....℔ doz $1.20
Pat. Peg, Plain Top, ℔ gr $10.00...45&10%
Pat. Peg, Leather Top.℔ gr $12.00.45&10%

Awls, Brad Sets, &c—

Awls, Sewing, Common ℔ gr $1.70, 35%
Awls, Should. Peg. ℔ gr $2.45, 40@40&10%
Awls, Pat. Peg...℔ gr 63¢.... 40@40&10%
Awls, Shouldered Brad..2.70 ℔ gr.....35%
Awls, Handled Brad...$7.50 ℔ gr.....45%
Awls, Handled Scratch ℔ gr, $7.50.35&10%
Awls, Socket Scratch, ℔ doz, $1.50.25@30%

Awl and Tool Sets—

Aiken's Sets, Awls and Tools, No. 20, ℔ doz $10.00.....55&10%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9.....25@25&10%
Miller's Falls Adj. Tool Hdls., Nos. 1, $12. 2, $18.....25%
Henry's Combination Haft...℔ doz $6.50
Brad Sets, No. 42, $10.50; No. 43, $12.50..70&10&5%
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50.....30&10%

Axes—

Makers' and Special Brands—

First quality .....℔ doz $6.00@$6.50
Others.....℔ doz $5.50@$5.75

Axle Grease—

Fraser's .....Keg ℔ 4¢, Pail ℔ 5¢
Fraser's, in boxes.....℔ gr $9.50
Dixon's Everlasting, in bxs...℔ doz 1 ℔. $1.20; 2 ℔ $2.00
Dixon's Everlasting....10-℔ pails, ea. 85¢
Lower grades, special brands, ℔ gr $5.50@$7.00

Axles—†

No. 1.....4¼@4½¢, No. 2 5¼¢@5½¢
Nos. 7 to 14.....55&5%
Nos. 15 to 18.....47½%
Nos. 19 to 22.....70%
National Tubular Self-Oiling: Standard Farm (1 to 5) and Special Farm (A1 to A5):
Less than 10 sets.....33⅓%
Over 10 sets.....33⅓&5%

Bag Holders.—

Sprengle's Pat.....℔ doz $18.....60%

Balances—

Spring Balances.....50%
Common 24-℔.....℔ doz $1.50.....50%
Chatillon's Spring Balances.....50%
Chatillon's Circular Spring Balances.60%

Bells—

Hand—

Light Brass..... .....70&10 @ 75%
Extra Heavy.....60&10%
White Metal.....60&10&10%
Silver Chime.....33⅓&10%
Globe (Cone's Patent).....25&10@35%

Door—

Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Taylor's.....25&10%
Crank Brooks'.....50&10&2%
Crank, Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. E. M. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%
Pull, Western.....25&10%

Cow—

Common Wrought.....60&10%
Western.....20&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Dodge, Genuine Kentucky....70@70&10%
Texas Star.....50&10@50&10&5%
Call.....40@40&5%
Farm Bells.....℔ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Bellows—

Blacksmiths' .....60@60&5%
Molders'.....40@40&10%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard .....70&10%
Standard.....70&70&5%
Extra.....60&5@60&10%
N. Y. B. & P. Co., Carbon.....60&10&5%
N. Y. B. & P. Co., Diamond.....50&10%

Bench Stops—

Morrill's.....℔ doz $9, 50%
Hotchkiss's.....℔ doz $5, 10@10&10%
Weston's, No. 1, $10; No. 2, $9.25&10&5%
McGill's.....℔ doz $3.....10%

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders—

Extension,
Barber's, ℔ doz $15.00.....40@40&10%
Ives, ℔ doz $20.00.....60&5@60&10%
Diagonal.....℔ doz $24.00, 40%
Angular.....℔ doz $24.00, 40&5%

Blind Adjusters—

Domestic.....℔ doz $3.00, 33⅓%
Excelsior.....℔ doz $10.00.....50&10&2%
Washburn's Self-Locking.....20@20&10%

Blind Fasteners—

Mackrell's, ℔ doz, $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ℔ gr..60&10%
Van Sand's Old Pat., $15.00 ℔ gr..55&10%
Washburn's Old Pattern, ℔ gr.....$9.00
Merriman's.....new list
Austin & Eddy No. 2008, ℔ gr.....$9.00
Security Gravity, ℔ gr..... .....$9.00

Blind Staples—

Barbed, ½ in. and larger.... ..℔ ℔ 7½@8¢
Barbed, ⅜ in.....℔ ℔ 8½@9¢

Blocks—

Ordinary Tackle, list May 20, 1889...50%
Cleveland Block Co., Mal. Iron.....50%
Moore's Novelty, Mal. Iron.....50%

Bolts—

Door and Shutter—

Cast Iron Barrel, Square, &c..70@70&10%
Cast Iron Shutter Bolts.....70@70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts.....60%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's ..60&10%
Wr't Shutter, Brass Knob, " ..40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....55&10%
Wr't Sunk Flush, Stanley's list....50&10%
Wr't B.K.Flush, Com'n " ....55&10%

Carriage, Machine, &c.—

Com. list June 10, '84.....75&10&2%
Genuine Eagle, list Oct., '84...75&10@80%
Phila. pattern, list Oct. 7, '84..80@80&10%
R.B.&W., old list 70%
Machine, according to size....80@80&5%
Bolt Ends, according to size...80@80&5%

Tire—

Common, list Feb. 28, '83.....70%
Port Chester Bolt and Nut Company:
Empire, list Feb 28, '83..... ... ..70%
Phila., list Oct. '84..... .....82½%
Keystone, Philadel., list Oct. '84....80%
Norway, Phila., list Oct. '84 ...75&10%
American Screw Company:
Norway, Phil., list Oct. 16, '84....75&10%
Eagle, Phil., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84..... .....82½%
Bay State, list Feb. 28, '83.....70%
R.B.&W., Philadel., list Oct. 16, '84...82½%

Stove and Plow—

Stove. 65%
Plow.....60&5%
R. B. & W., Plow.....55%

Borax.....℔ ℔ 9½@10½¢

Boring Machines—

	Without Augers.	Upright.	Angular.	
Douglas	$5.50	$6.75		50%
Snell's, Rice's Pat.	5.50	6.75	...40&10&10	
Jennings	5.50	6.75	...45@45&10	
Other Machines...	2.35	2.75		net
Phillips' Patent with Augers ...	00	7.50	.....	

Bow Pins—

Humason, Beckley & Co.'s... .....60&10%
Sargent & Co's....$17 and $18.....60&10%
Peck, Stow & W. Co. 50&10&50&10&5%

Braces.—

Barber's,
Nos. 10 to 16.....50%
Nos. 30 to 33.....50%
Nos. 40 to 63.....50&10%
Barker's,
Nos. 8, 10 and 12.....75&10@80%
Plated, Nos. 8, 10 and 12....65&10@70%
Osgood's Ratchet.....40&10@50%
Spofford's.....50&5@50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barbers.....60&5%
Spofford.....60&5@60&10%
Common Ball, American.....$1.00@$1.10
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Amidon's
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Rachet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
P. S. & W.....50&10%

Brackets—

Shelf plain, Sargent's list, 55&10@55&10&10%
Shelf, fancy, Sargent's list, 60&10@60&10&10%
Reading, plain.....50&10@60&10&5%
Reading, Rosette.....60&10@60&10&10%

Bright Wire Goods.....87½

Broilers—

Henis' Self- } Inch.....	9	10	9x11
Basting. } Per doz...	$4.50	5.50	6.50

Buckets—See Well Buckets and Pails.

Bull Rings—

Union Co. Nut.....55%
Sargent's.....60%&10@70&5%
Hotchkiss' low list.....30%
Humason, Beckley & Co.'s.....70%
Peck, Stow & W. Co's..50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%

Butcher's Cleavers—

Bradley's.....25@30%
L. & I. J. White.....20&5%
Beatty's.....40@40&5%
New Haven Edge Tool Co.'s.....40%
P. S. & W.....33⅓&5@33⅓&10%
Foster Bros.....30%
Schulte, Lohoff & Co.....40@40&5%

Butts—

Brass—

Wrought Brass.....75@75&10%
Cast Brass, Tiebout's'.....33⅓%
Cast Brass, Corbin's, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—

Fast Joint, Narrow.....50&10&5@60&5%
Fast Joint, Broad.....55&10&5@60&10%
Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns..
Parliament Butts.....
Mayer's Hinges.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned....
Loose Pin, Acorns, Japanned, Plated Tips.....
} ..70&10 @75%

Wrought Steel—

Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Fast Joint, Broad.....
Loose Joint, Broad.....
Table Butts, Back Flaps, &c.....
Inside Blind, Regular.....
Inside Blind, Light.....
Loose Pin.....
} .70&10 @75%

Bronzed Wrought Butts. 50%

Calipers—

See Compasses.

Calks, Toe—

Gautier..... .....℔ ℔ 5½@6¢
Dewicks (Burke)..... .....℔ ℔ 5½@6¢

Can Openers—

Messenger's Comet.....℔ doz $3.00,'25%
American.....℔ gross $3.00
Duplex.....doz 25¢, 15@20%
Lyman's.....℔ doz $3.75, 20%
No. 4 French.....℔ doz $2.25, 55@60%
No. 5, Iron Handle.....℔ gr $6.00, 45@50%
Eureka.....℔ doz $2.50, 10%
Sardine Scissors.....℔ doz $2.75@3.00
Star.....℔ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50 50&10&10%
World's Best, ℔ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ℔ doz $3.00..... .....35&5%
Domestic, ℔ doz $2.50.....40%
Champion ℔ doz $2.00.....50

Cards—
Horse & Curry.....10&10@10&10&10%
Cotton.....10@10&10%
Wool.....10@10&10%

Carpet Stretchers—
Cast Steel, Polished.....₱ doz $2.25
Cast Iron, Steel Points.....₱ doz 80¢
Socket.....₱ doz $1.75
Bullard's.....25@25&10%

Carpet Sweepers—
Bissell No. 5.....₱ doz $17.00
Bissell No. 7 New Drop Pan.₱ doz $19.00
Bissell, Grand.....₱ doz $36.00
Grand Rapids.....₱ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic.....₱ doz $15.00
Jewel.....₱ doz $17.00
Improved Parlor Queen, Nickeled.....₱ doz $27.00
Japanned.....₱ doz $24.00
Excelsior.....₱ doz $22.00
Garland.....₱ doz $18.00
arlor Queen.....₱ doz $24.00
Housewife's Delight.....₱ doz $15.00
Queen.....₱ doz $16.00
Queen, with band.....₱ doz $18.00
King.....₱ doz $30.00
Weed, Improved.....₱ doz $18.00
Hub.....₱ doz $16.00
Cog-Wheel.....₱ doz $16.00
Conqueror.....₱ doz $22.00
Easy.....₱ doz $22.00
Monarch.....₱ doz $22.00
Goshen.....₱ doz $21.00
Advance.....₱ doz $18.00
Ladies' Friend, No. 1, ₱ doz, $15.00; No. 2.....₱ doz $16.00
American.....₱ doz $15.00
Grand Republic.....₱ doz $35.00

Cartridges—
See Ammunition.

Casters—
Bed..... } Brass....55@55&10%
Plate..... } Others...60@60&10%
Shallow Socket.....
Deep Socket.....40&10%
Yale Casters, list May, 1884...30&10@40%
Yale, Gem.....60@60&5%
Martin's Patent (Phœnix).....45&10@50%
Payson's Anti-friction.....60@60&10%
Giant Truck Casters.....30%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50%

Cattle Leaders—
Humason, Beckley & Co.'s.....70%
Sargent's.....66⅔&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....50&10%

Chain—
Trace, 6½-10-2, exact, ₱ pair, $1.03.....50&10@50&10&5%
Trace, 6½-10-3, exact, ₱ pair 92¢.....50&10@50&10&5%
Trace, 7-10-2, exact, ₱ pair $1.11.....50&10@50&10&5%
NOTE.—Traces, "Regular" sizes, 3¢ net ₱ pair less than exact.
Log, Fifth, Stretcher, and other fancy Chains, List Nov. 1, 1884 50&10@50&10&5%
American Coil, in cask lots,
3-16 ¼ 5-16 ⅜ 7-16 ½ ⅝ ¾
$8.25 5.75 5.00 4.00 3.70 3.60 3.50 3.40
Less than cask lots, add ¼¢@½¢ ₱ ℔.
German Coil, list of June 20, 1887 50&10&5&60%
German Halter Chain, list of June 20, 1887.....50&10&5@60%
Covert Halter.....60&2%
Covert Traces.....35@2%
Oneida Halter Chain.....60@60&5%
Galvanized Pump Chain.....₱ ℔ 5½@6¢
Jack Chain, Iron.....75@75&5%
Jack Chain, Brass.....70@70&5%

Chalk—
White.....₱ gr 50¢
Red.....₱ gr 70¢
Blue.....₱ gr 85¢
See also Crayons.

Chalk Lines—
See Lines.

Chisels—
Socket Framing and Firmer.
P. S. & W..... } 75&10 @ 75&
New Haven..... } 10&5%
Witherby..... } 10&5%
Mix..... } 10&5%
Ohio Tool Co.....
Douglass.....75@75&5%
Buck Bros.....30%
Merrill.....60&10@60&10&5%
L. & I. J. White.....30@30&5%
Tanged and Miscellaneous.
Tanged Firmers.....40&10@50%
Butchers'.....$4.75@$5.00
Spear & Jackson's.....$5 to £
Buck Bros.....30%
Cold Chisels, ₱ ℔.....16@19¢

Chucks—
Beach Pat.....each, $8.00.....20%
Morse's Adjustable,each, $7.00, 20@20&5%
Danbury.....each, $6.00, 30@30&5%
Syracuse, Balz Pat.....25%
Skinner's Pat. Drill Chucks.....30%
Skinner's Independent Lathe Chucks.40%
Skinner's Pat. Comb. Chuck.....40%

Clamps—
R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Gray's.....20%
Adjustable, Lambert's.....20%
Adjustable, Snow's.....40&5%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....20&10%
Stearn's Adjustable Cabinet and Corner.....20&10%
Cabinet, Sargent's.....66⅔&10%
Carriage Makers', Sargent's.....70&10%
Eberhard Mfg. Co.....40&5&40&10%
Warner's.....40&10@40&10&5%
Saw Clamps, see Vises

Clips—
Norway, Axle, ¼ & 5-16.....55&5&5%
2nd grade Norway Axle, ¼ & 5-16 65&5%
Superior Axle Clips.....66⅔&5&70%
Norway Spring Bar Clips, 5-16..60&5&5%
Wrought-Iron Felloe Clips.....₱ ℔, 5½¢
Steel Felloe Clips.....₱ ℔, 5¢
Baker Axle Clips.....25%

Cockeyes.....50%

Cocks, Brass.
Hardware list.....50&2%

Coffee Mills—
Box and Side, List Jan. 1, 1888.....60&2%
American, Enterprise Mfg Co.20&10@30%
The Swift, Lane Bros.....20&10%

Compasses Dividers, &c—
Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's
Spring Calipers and Dividers 25&10&10%
Lock Calipers and Dividers.....25&10%
Combination Dividers.....25&10%

Coopers' Tools—
Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%

Corkscrews—
Humason & Beckley Mfg. Co..40@40&10%
Clough's Pat.....33⅓@33⅓&5%
Howe Bros & Hulbert.....35%

Corn Knives and Cutters—
Bradley's.....10%
Wadsworth's.....25%

Cradles—
Grain.....50&2%

Crayons.
White Crayons, ₱ gr 12¢@12½¢.....10%
D. M. Stewart Mfg. Co., Metal Workers, ₱ gr, $2.50.....25%
D. M. Stewart Mfg. Co., Rolling Mill, ₱ gr, $2.50.....25%
See also Chalk.

Crow Bars—
Cast Steel.....₱ ℔ 4¢
Iron, Steel Points.....₱ ℔ 3½¢

Curry Combs—
Fitch's.....50&10@50&10&10%
Rubber per doz $10.00.....20%
Perfect.....50%

Curtain Pins—
Silvered Glass.....net
White Enamel.....net

Cutlery—
Beaver Falls & Booth's.....33⅓
Wostenholme.....$7.75 to £

Dampers, &c—
Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Dividers—
See Compasses.

Dog Collars—
Embossed, Gilt, Pope & Steven's list 30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%

Door Springs—
Torrey's Rod, regular size....₱ doz $1.30
Gray's, ₱ gr., $20.00.....20%
Bee Rod ₱ gr., $20.00.....20%
Warner's No. 1, ₱ doz, $2.50; No. 2, $3.30.....40&10&50%
Gem (Coil), list April 19, 1886.....10%
Star (Coil), list April 19, 1886.....20%
Victor (Coil).....60@60&10%
Champion (Coil).....60&10@60&10&10%
Philadelphia, 5 in., $5.00; 8 in., $7.75..
Cowell's....No. 1, ₱ doz, $18.00; No. 2, $15.00.....50%
Rubber, complete, ₱ doz, $4.50.....55&10%
Hercules.....50%
Shaw Door Check and Spring.25@30@35%

Drawing Knives—
Witherby..... } 75&10 @ 75&10
P. S. & W..... } &5%
Mix..... } &5%
New Haven.....
Merrill.....60&10@60&10&5%
Douglas.....75@75&5%
Watrous.....15&10@25%
L. & I. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Drills and Drill Stocks—
Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50.20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's.....each $2.50, 25&10@40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....20@20&5%
Ratchet, Whitney's.....20&10%
Ratchet, Weston's.....20@25%
Ratchet, Moore's Triple Action...25@30%
Ratchet, Curtis & Curtis.....30%
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools...$1.75@$1.85

Twist Drills—
Morse.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%
Cleveland.....50&10&5%
Williams.....50&10&10%
New Process.....50&10&5%

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans—
Smallsizes,.....₱ ℔ 6¼¢
Large sizes.....₱ ℔ 6¼¢

Egg Beaters.
Dover.....₱ doz $1.50
National, ₱ doz $4.50.....33⅓%
Family (T. & S. Mfg. Co.), ₱ gro $17.00@$18.00
Duplex (Standard Co.).....₱ gro $15.00
Rival (Standard Co.).....₱ gro $12.00
Large Dupiex (Standard Co.), ₱ doz $4.50
Triumph (T. & S. Mfg. Co.), ₱ gro $10.50 @$11.50
Advance, No. 1.....₱ gro $10.50
Advance, No. 2.....₱ gro $10.00
Bryant's.....₱ gro $14.00
Ayres' Spiral.....₱ gro $5.00
Double (H. & R. Mfg. Co).....₱ gro $16.20
Easy (H. & R. Mfg. Co.).....₱ gro $14.00
Triple (H. & R. Mfg. Co.).....₱ gro $16.20
Spiral (H. & R. Mfg. Co.).....₱ gro $4.50
Paine, Diehl & Co.'s.....₱ gro $24.00

Egg Poachers—
Buffalo Steam Egg Poachers, ₱ doz, No. 1, $6.00; No. 2, $9.00.....25%

Electric Bell Sets.—
Wollensak's.....20%
Bigelow & Dowse.....20%

Emery— No. 4 to 46 gr. | No. 54 to 150 gr. | Flour, CF FF.
Kegs, ₱ ℔....4½¢ | 5 ¢ | 2½¢
⅛ kegs, ₱ ℔...4¾¢ | 5¼¢ | 2¾¢
¼ kegs, ₱ ℔...5 ¢ | 5½¢ | 3 ¢
10-℔ cans, 10 in case....6 ¢ | 6¼¢ | 5 ¢
10-℔ cans, less than 10.....10 ¢ | 10 ¢ | 7½¢

Enameled and Tinned Ware—
See Hollow-Ware.

Escutcheon Pins—
Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Escutcheons.
Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Faucets.—
Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓&5
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined....60&10@60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₱ doz $50.00.....20&10%
Lane's, ₱ doz $36.00.....25&10%
Victor, ₱ doz $36.00.....25 &10%

Felloe Plates.....₱ ℔ 6@6¼¢

Fifth Wheels.—
Derby and Cincinnati.....45&5%

Files—
Domestic—
Nicholson Files, Rasps, &c.....60&10@60@10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75% (extra prices on certain sizes)
Other makers, best brands 60&10@60&10&10%
Fair brands.....60&10&10@70%
Second quality.....70&10@75&10%
Nicholson's Horse Rasps....60&10@60& 10&5%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chelsea Horse Rasps, Hand Cut...50&10%
Imported—
J. & Riley Carr....List, April 1, 1883, 15%
J. & Riley Carr Horse Rasps.....10%
Moss & Gamble....List, April 1, 1883, 15%
Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25@30%
Turton's.....Turton's list, 20@25%
Greaves' Horse Rasps..American list, 60%

Fluting Machines—
Knox, 4½-inch Rolls.....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3¼-inch Roll, $2.15.....35%
Eagle, 5½-inch Roll, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in. $4.50 each.....35%
Domestic Fluter.....each, $1.60
Geneva Hand Fluter, White Metal ₱ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00.....30%
Shepard Hand Fluter, No. 85 ₱ doz $15.30.....40%
Shepard Hand Fluter, No. 110 ₱ doz $11.00.....40%
Shepard Hand Fluter, No. 95 ₱ doz $8.00.....40%
Clark's Hand Fluter. ₱ doz $15.00.....35%
Combined Fluter and Sad Iron, ₱ doz $15.00.....30%
Buffalo.....₱ doz $10.00.....10%

Fluting Scissors—.....45%

Fodder Squeezers—
Blair's.....₱ doz $2.00
Blair's "Climax".....₱ doz $1.25

Forks—
Hay, Manure, &c., Asso. List.....65%
Hay, Manure, &c., Phila. List 60@60&5%
Plated, see Spoons.

Freezers, Ice Cream—
Buffalo Champion.....65&65&5%
Shepard's Lightning.....65 @ 65&5%
White Mountain.....50&20&5%
New Arctic.....50&40&5%
American.....60%
Gem.....65%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60%
Peerless and Giant.....60&10
Zero and Pet.....65&10
Boss.....65&10&10
Keystone, each, $1.50.....25%

Fruit and Jelly Presses—
Enterprise Mfg. Co.....20&10@30%
Henis.....₱ doz $2.50
Shepard's Queen City.....40%

Fry Pans—
High List.....75&5@75&10
No..... 0 1 2 3 4
₱ doz..$3.75 $4.70 $5.30 $5.95 $6.55
No..... 5 6 7 8
₱ doz.....$7.50 $8.75 $10.00 $11.25
Low List.....65&10%
No..... 0 1 2 3 4
₱ doz..$3.00 $3.75 $4.25 $4.75 $5.25
No..... 5 6 7 8
₱ doz.....$6.00 $7.00 $8.00 $9.00

Fuse— ₱ 1000 ft
Common Hemp Fuse, for dry ground.$2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 4.25
Double Taped Fuse, for very wet gr. 5.40
Triple Taped Fuse, for very wet gr.. 6.50
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water.12.00

Gauges—
Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch, 25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....50@50&5%
Wire, Brown & Sharpe's.....10@20%

Gimlets—
Nail and Spike.....50&10&5%
"Eureka" Gimlets.....40&10%
"Diamond" Gimlets.....₱ gr $5.00
Double Cut, Shepardson's.....45@45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
"Bee," ₱ gr $12.....25@25&5%

Glue—
Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Le Page & Co.'s Improved Process 25@25&5%

Glue Pots—
Tinned.....40%
Enameled.....40&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Grindstones—
Small, at factory....₱ ton $7.50@9.00

Grindstone Fixtures—
Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%

Hack Saws.—
See Saws.

Halters—
Covert's, Rope, ½-in. Jute.....50&2%
Covert's, Rope, ½-in. Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie, 50&2%
Covert's Jute Horse and Cattle Ties, 60&10&2%

Hammers—
Handled Hammers—
Maydole's, list Dec. 1, '85.....25&10@35%
Buffalo Hammer Co.... } List Jan. 15, '87
Humason & Beckley... } 50@50&10%
Atha Tool Co..... }
Fayette R. Plumb.....40&10@50%
C. Hammond & Son.....40&10@50%
Vernce.....5%
Magnetic Tack, Nos. 1, 2, 3, 4, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@25
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%
Heavy Hammers and Sledges—
3 ℔ and under..... ₱ ℔ 40¢ } 60&10
3 to 5 ℔..... ₱ ℔ 36¢ } &10 @ 70%
Over 5 ℔..... ₱ ℔ 30¢ }
Wilkinson's Smiths.....10½¢@11¢ ₱ ℔

Handcuffs and Leg Irons—
R. I. Tool Co., Handcuffs, $15.00 ₱ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₱ doz 10%
Tower's.....25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₱ doz $48.00; Nickeled, $57.00; 3 Hands, Polished, ₱ doz $72.00; Nickeled, $84.00.....2 5

Handles—
Iron, Wrought or Cast—
Door or Thumb.
Nos..... 0 1 2 3 4
Per doz....$0.90 1.00 1.18 1.35 1.50
60&10&10%
Roggin's Latches.....₱ doz 30@35¢
Bronze Iron Drop Latches..₱ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88.....net
Barn Door, ₱ doz $1.40.....10&10%
Chest and Lifting.....70%
Handles, Wood—
Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, Sledge, &c...40%
Brad Awl.....₱ gr $2.00
Hickory Firmer Chisel, ass'd. ₱ gr 4.50 } ₱ set
Hickory Firmer Chisel, large. ₱ gr 5.00 }
Apple Firmer Chisel, ass'd...₱ gr 5.00 } ₱ set
Apple Firmer Chisel, large...₱ gr 6.00 }
Socket Firmer Chisel, ass'd..₱ gr 3.00 } ₱ set
Socket Framing Chisel, ass'd. ₱ gr 5.00 }
J. S. Smith & Co.'s Pat File.....50%
File, assorted.....₱ gr 2.75 } 40@
Auger, assorted.....₱ gr 5.00 } 40&10%
Auger, large.....₱ gr 7.00 }
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass'.....₱ set $1.25
Pat. Auger, Swan's.....₱ set $1.00
Hoe, Rake, Shovel, &c.....50&10%

Cross-Cut Saw Handles—
Atkins' No. 1 Loop, ℔ pair, 28¢; No. 3, 18¢; No. 6, 16¢; No. 2 and No. 4 Reversible, 18¢.
Boynton's Loop Saw Handles, 50¢... 60%
Champion....15¢

Hangers—
Barn Door, old patterns...60&10&10@70%
Barn Door, New England..60&10&10@70%
Samson Steel Anti-Friction....55%
Orleans Steel....55%
Hamilton Wrought Wood Track....55%
U. S. Wood Track....65%
Champion....60&10%
Rider and Wooster, Medina Mfg. Co.'s list....70%
Climax Anti-Friction....60%
limax Anti-Friction for Wood Track..55%
Zenith for Wood Track.... ... .55%
ed's Steel Arm.... ....50%
allenge, Barn Door 50%
Sterling's Imp'ved (Anti-Friction).65&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00....50&2%
Cheritree....50&10%
Kidder's....50&10&60%
The Boss....60&10%
Best Anti-Friction....60&10%
Duplex (Wood Track)....60&10&5%
Terry's Pat., ℔ doz pr. 4 in, $10.00; 5 in. $12.00....50&5&50&10%
Cronk's Pat., No. 4, $12.00; No. 5, $14.40; No. 6, $18.00....50&15@60%
Wood Track Iron Clad, ℔ ft. 10¢....50 &15@60%
Carrier Steel Anti-Friction....50@50&5%
Architect, ℔ set $6.00....20%
Eclipse....20&10%
Felix, ℔ set $4.50....20%
Richards'....30@30&10%
Lane's Steel Anti-Friction....50%
Ball Bearing Door Hanger..20&10@25&10%
Warner's Pat....20@20&10%
Stearns' Anti-Friction....20@20&10%
Stearns' Challenge....25&10@25&10&10%
Faultless....40@40&5%
American, ℔ set $6.00....20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢....40%
Paragon, Nos. 1, 2 and 3....40&10%
Paragon, Nos. 5, 5½, 7 and 8....20&10%
Crescent....60@60&10%
Nickel, Cast Iron....50%
Nickel, Malleable Iron and Steel....40%
Scranton Anti-Friction Single Strap..33⅓&5
Scranton Anti-Friction Double Strap..40%
Universal Anti-Friction....40%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00....45%
Star....40&10@40&10&5%
May....50&5@50&10%
Barry, $6.00....40&10%

Harness Snaps—
See Snaps.

Hatchets—
List Jan. 1, 1886.
Isaiah Blood....35@40%
Hunt's Shingling, Lath and Claw..40&5%
Hunt's Broad....40%
Buffalo Hammer Co....40&10@50%
Hurd's....40&10@50%
Fayette R. Plumb....40&10@50%
Wm. Mann, Jr., & Co....50@50&5%
Underhill Edge Tool Co....40&5@40&10%
Underhill's, Haines and Bright....33⅓&
C. Hammond & Son....40&10@50%
Simmons'....40&10@50%
Peck's....40&10@40&10&5%
Kelly's....50@50&5%
Sargent & Co....50%
Ten Eyck Edge Tool Co.40&10@40&10&5%
Collins....10%
Schulte, Lohoff & Co....50@50&5%

Hay and Straw Knives—
Lightning...Mfrs'. price ℔ doz $18.00, 25% But jobbers frequently give extras.
Gem....℔ doz $10
Wadsworth's....40&7½@40&10%
Carter's Needle....℔ doz $11.50@$12.00
Heath's....℔ doz $13.50@14.00
Auburn Hay, Com. and Spear Point..50%
Auburn, Straw....40%
Nolin's Hay....℔ doz $10.00

Hinges—
Wrought Iron Hinges
Strap and T....75&5@75&10%
Screw Hook and Strap: 6 to 12 in., ℔ ₵... 3¼¢; 14 to 20 in., ℔ ₵... 3¼¢; 22 to 36 in., ℔ ₵... 2¾¢
Heavy Welded Hook: 6 to 12 in., ℔ ₵... 3¼¢; 14 to 20 in., ℔ ₵... 3¼¢; 22 to 36 in., ℔ ₵... 2¾¢
Screw Hook and Eye: ⅛ in., ℔ doz $1.50; ⅜ in., ℔ doz $2.45; ¾ in., ℔ doz $3.80 — 10%
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate....70&10%
Rolled Raised....70&10%
Plate Hinges and "Providence": 8, 10 & 12 in., ℔ ₵....5¢; over 12 in., ℔ ₵....4¢
Spring Hinges—
Geer's Spring and Blank Butts....40%
Union Spring Hinge Co.'s list, March, 1886....20%
Acme....30%
U. S....25&10%
Empire and Crown....20%
Hero and Monarch....55%
American, Gem, and Star....20%
Oxford....20%
Barker's Double Acting....20&10%
Union Mfg. Co....25%
Bommer's....30%
Buckman's....15@20%
Chicago....30%
Wiles'....10%
Devore's....40%
Rex....40%
Royal....60%
Reliable....60%
Champion....60%
Gate Hinges—
Western....℔ doz $4.40, 60%
N. E....℔ doz $7.00, 55%
N. E. Reversible....℔ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3....60&10&5%
N. Y. State....℔ doz $5.00, 55&10%
Automatic....℔ doz $12.50, 50%
Common Sense....℔ doz pair $4.50, 50%
Seymour's....45&10%
Shepard's....60&10&5%
Reed's Latch and Hinges. ℔ doz $12.00, 50%
Blind Hinges—
Parker....75&2%
Palmer....50&5&10%
Seymour....70&2%
Nicholson....45&10%
Hafer....50%
Clark's, Nos. 1, 3, 5, 40 and 50 75&10&5@80%
Clark's Mortise Gravity....50%
Sargent's, Nos. 1, 3, 5, 11, 13 75&10@55&10&5%
Sargent's, No. 12....77&10&10%
Reading's Gravity....75&10@75&10&5%
Shepard's
Noiseless....75&10&5%
Niagara....80&2½%
Buffalo....80&5%
Clark's Genuine Pat....80&5%
O. S., Lull & Porter....75&10@80%
Acme, Lull & Porter....75&5%
Queen City Reversible....75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50....25&2%

Hoes—
Handled—
Garden, Mortar, &c....65%
Planter's, Cotton, &c....65%
Warren Hoe....60%
Magic....℔ doz $4.00
Eye—
D. & H. Scovill....20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat....45&5%
Sandusky Tool Co., S. & O. Pat....60%
Hubbard & Co., S. & O. Pat....60%
Chattanooga Tool Co., S. & O. Pat...60%
Grub....60&60&10%

Hog Rings and Ringers—
Hill's Improved Ringers....℔ doz $4.25
Hill's Old Style Ringers....℔ doz $2.75
Hill's Tongs....℔ doz $4.50
Hill's Rings....℔ doz bxs $2.15@2.25
Perfect Rings....℔ doz bxs $1.60@1.70
Perfect Ringers....℔ doz $2.15@$2.25
Blair's Hog Ringers....℔ doz $2.25@2.50
Blair's Hog Rings....℔ doz 90¢@$1.00
Champion Ringers....℔ doz $2.00
Champion Rings, Double....℔ doz $2.25
Brown's Ringers....℔ doz $2.00
Brown's Rings....℔ doz $1.25@1.30

Hoisting Apparatus—
Moore's Hand Hoist, with Lock Brake....20%
Moore's Differential Pulley Block...40%
Energy Mfg. Co's....25%

Holders, File and Tool—
Balz Pat....℔ doz $4.00; 25%
Nicholson File Holders....20%

Hollow-Ware—
Iron—
Stove Hollow-Ware—
Ground....60@60&5%
Unground....60&10@60&10&10%
Boilers and Saucepans....40&5%
Tinned Boilers and Saucepans....40%
Gray Enameled-Ware—
Stove....45@50%
Maslin Kettles....60&10@60&10&10%
Boilers and Saucepans....40&5%
Agate and Granite Ware, list Jan. 1, 1889....33⅓&10%
Rustless Hollow-Ware....50@50&5%
Galvanized Tea-Kettles—

Inch	6	7	8	9
Each	55¢	60¢	65¢	75¢

Silver Plated—
4 mo. or 5 % cash in 30 days.
Reed & Barton, Meriden Britannia Co., Simpson, Hall, Miller & Co., Rogers & Brother, Hartford Silver Plate Co — 40&5%
William Rogers Mfg. Co....40&5&5%

Hooks—
Cast Iron—
Bird Cage, Sargent's list....
Bird Cage, Reading....
Clothes Line, Sargent's list..
Clothes Line, Reading list.... — 60&10&10%
60&10@60&10&10%
Ceiling, Sargent's list....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading..50&10@50&10&10%
Wrought Iron—
Cotton....℔ doz $1.25
Cotton Pat. (N.Y. Mallet & Handle W'ks). 30%
Tassel and Picture (T. & S. Mfg. Co.)...50%
Wrought Staples, Hooks, &c. See Wrought Goods.
Wire—
Wire Coat and Hat, Gem, list April, 1886....50%
Wire Coat and Hat, Miles', list April, 1886....50%
Indestructible Coat and Hat....45%
Wire Coat and Hat, Standard....45%
Belt....80@80&10%
Miscellaneous.
Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass....℔ doz $2.25
Bush....55@60%
Whiffletree—Patent....55%
Hooks and Eyes—Malleable Iron.
Hooks and Eyes—Brass....60&10&10%
Fish Hooks, American....50%
Bench Hooks....See Bench Stops.

Horse Nails—

	Nos. 6	7	8	9	10
Ausable	28¢	26¢	25¢	24¢	23¢.

25&10@25&10&10%
Clinton, Fin....10½ @ 11¢, net
Essex....28¢ 26¢ 25¢ 24¢ 23¢.
25&10@25&10&10%
Lyra....25¢ 23¢ 22¢ 21¢ 20¢.
40&10&5@50%
Snowden....25¢ 23¢ 22¢ 21¢ 20¢.
40&10&5@50%
Putnam....23¢ 21¢ 20¢ 19¢ 18¢.
1000 ℔ in year 15%
Vulcan....23¢ 21¢ 20¢ 19¢ 18¢..12½&5%
Northwest'n.25¢ 23¢ 22¢ 21¢ 20¢.
10&10&5&5%
Globe....23¢ 21¢ 20¢ 19¢ 18¢..20&2½%
Boston....23¢ 21¢ 20¢ 19¢ 18¢..20&2½%
A. C....25¢ 23¢ 22¢ 21¢ 20¢.
25&10@33⅓&5%
C. B.-K....25¢ 23¢ 22¢ 21¢ 20¢.
25&10@33⅓&5%
Champlain .28¢ 6¢ 25¢ 24¢ 23¢.
25&10&10%
New Haven..28¢ 26¢ 25¢ 24¢ 23¢.
25&10@25&10&10%
Saranac....23¢ 21¢ 20¢ 19¢ 18¢...30&10%
Champion...25¢ 23¢ 22¢ 21¢ 20¢.
10&10&10%
Capewell....28¢ 26¢ 25¢ 24¢ 23¢.
35&5@35&10%
Star....23¢ 21¢ 20¢ 19¢ 18¢.
10&10@10&12½%
Anchor....23¢ 21¢ 20¢ 19¢ 18¢....35%
Western....23¢ 21¢ 20¢ 19¢ 18¢...40&10%
Empire Bronzed....14 ℔ ₵.

Horse Shoes—See Shoes Horse.

Hose, Rubber—
Competition....75&10@75&10&5%
Standard....70@70&10%
Extra....60@60&10%
N. Y. B. & P. Co., Para....30&10%
N. Y. B. & P. Co., Extra....50%
N. Y. B. & P. Co., Dundee....60&10&5%

Huskers—
Blair's Adjustable....℔ gr $8.00
Blair's Adjustable Clipper....℔ gr 7.00

Indurated Fiber-Ware—25%.
Spittoons, No. 2, ℔ doz....$9.00
Basins, Ringed, ℔ doz., No. 1, $4.80; No. 2, $4.20; No. 3....$3.60
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ℔ nest....$7.50
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), ℔ nest....$3.70
Butter Bowls 15, 17 and 19-inch (3 pieces), ℔ nest....$2.25
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces) ℔ set....$4.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), ℔ set....$3 00
See also *Pails.*

Jack Screws—See Screws.

Kettles— Spun. Stamped.
Brass, 7 to 17 in., ℔ ₵.... 24¢ 21 ¢
Brass larger than 17 in., ℔ ₵.... 26¢ 23½¢
Enameled and Tea Kettles. See *Hollow-Ware.*

Keys—
Lock Asso'n list Dec. 30, 1886...50&10@60&5%
Eagle, Cabinet, &c....33⅓&2%
Hotchkiss' Brass Blanks....40%
Hotchkiss, Copper and Tinned....40%
Hotchkiss' Pad. and Cab....35%
Ratchet Bed Keys....℔ doz $4.00, 15%
Wollensak Tinned....50&10%

Knife Sharpeners—
Parkin's.
Applewood Handles...℔ doz $6.00, 40%
Rosewood or Cocobolo.℔ doz $9.00, 40%

Knives—
Wilson's Butcher Knives....25@30%
Ames' Butcher Knives....25%
Foster Bros.' Butcher, &c....40%
Nichols' Butcher Knives....40&10%
Ames' Shoe Knives....20@25%
Ames' Bread Knives, ℔ doz $1.50, 15@20%
Moran's Shoe and Bread....20%
Hay and Straw....See Hay Knives.
Table and Pocket....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat., $2.00
Corn, Auburn Mfg. Co. Crescent....$3.50

Knobs—
Door Mineral....65@68%
Door Por. Jap'd....75@78%
Door Por. Nickel....$2.00@2.25
Door Por. Plated, Nickel....$2.00@2.25
Drawer, Porcelain....60&10@60&10&10%
Hemacite Door Knobs....40&10@50%
Yale & Towne Wood, list Dec., 1885...40%
Furniture Plain....75¢ gro inch, 10%
Furniture, Wood Screws....25&10%
Base, Rubber Tip....70&10&5%
Picture, Judd's....50&10&10@70%
Picture, Sargent's....70&10%
Picture, Hemacite....35&5%
Shutter, Porcelain....65&10%
Carriage, Jap....℔ gro 80¢, 60&10%

Ladles.—
Melting, Sargent's....55&10%
Melting, Reading....35&10%
Melting, Monroe's Pat...℔ doz $4.00, 40%
Melting, P. S. & W....35&10@40%
Melting, Warner's....30%

Lawn Mowers—
Standard List....50&10%
Quaker City....60&10%
Enterprise....60&10%

Lanterns—
Tubular—
Plain with Guards, ℔ doz....$4.00@4.25
Lift Wire, with Guards....$4.50@4.75
Square Plain, with Guards....$4.00@4.25
Sq. Lift Wire, with Guards....$4.25@4.50
Without Guards, 25¢ ℔ doz less.
Miscellaneous.
Police, Small, $6.00; Medium, $7.25; Large, $9.75....20@25%

Lemon Squeezers—
Porcelain Lined, No. 1....℔ doz $6.00, 25&30%
Wood, No. 2....℔ doz $3.00, 35%
Wood, Common....℔ doz $1.70@1.75
Dunlap's Improved....℔ doz $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ℔ doz....25&10%
Jennings' Star....℔ doz $2.50
The Boss....℔ doz $2.50
Dean's...Nos. 1, ℔ doz $6.50; 2, $3.35; 3, $1.90

Little Giant....50@50&5%
King....40&5%

Lines—
Cotton and Linen Fish, Draper's....50%
Draper's Chalk....60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25....25%
Cotton Chalk....50%
Samson, Cotton, No. 4, ℔; No. 4½, $2.50; 10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ℔ gro....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.
Mason's Colored Cotton....45%
Wire Clothes.. Nos. 18 19 20
$3 60 $3.00 $2.5

Ventilator Cord, Samson Braided, White or Drab Cotton..℔ doz $7.50, 20%

Locks, &c.—
Door Locks, Latches, &c.
R. & E. Mfg. Co., list Mar.20, 1889.
Mallory, Wheeler & Co., list July, '88
Sargent & Co., list Aug. 1, '88
Reading Hardware Co., list Feb. 2, '88,.... — 60&10@60 &10&10%
Note.—Lower net prices often made.
Perkins' Burglar Proof....60&25%
Plate....33⅓&2%
F. Many's "Extension Cylinder" $10.50 ℔ doz.
Barnes Mfg. Co....40@40&10%
Yale....net prices
Deitz Flat Key....30%
L. & C. Round Key Latches....30&10%
L. & C. Flat Key Latches....33⅓&10%
Romer's Night Latches....15%
Shepardson or U. S....35%
Felter or American....40&10%
Seed's N. Y. Hasp Lock....25%
Cabinet—
Eagle, Gaylord Parker and Corbin... } List March, '84, rev Jan.1,'85..33⅓&2%
Deitz, Nos. 36 to 39....40%
Deitz, Nos. 51 to 63....40&10%
Deitz, Nos. 86 to 96....30%
Stoddard Lock Co....30@33⅓%
"Champion" Night Latches....40%
Barnes Mfg. Co....40@40&10%
Eagle and Corbin Trunk....25&2%
"Champion" Cab. and Combin...33⅓%
Yale....net prices
Romer's....25%
Padlocks—
List Dec. 23, '84....75@75&10%
Yale Lock Mfg. Co.'s....net prices
Eagle....25&2%
Eureka, Eagle Lock Co....40&2%
Romer's, Nos. 0 to 91....30%
Romer's Scandinavian, &c., Nos. 100 to 505...15%
A. E. Deitz....40%
Champon Padlocks....40%
Hotchkiss....30%
Star....45%
Horseshoe....℔ doz, $9. 40@40&10%
Barnes Mfg. Co....40@40&10%
Nock's....30%
Brown's Pat....25%
Scandinavian....90@90&10%
Fraim's Pat. Scandavian low list....60%
Ames Sword Co. up to No. 150....40%
Ames Sword Co. above No. 150....50%

Lumber Tools.
Ring Peavies, "Blue Line"....℔ doz $20.00
Ring Peavies, Common....℔ doz $18.00
Steel Socket Peavies....℔ doz $21.00
Mall. Iron Socket Peavies....℔ doz $19.00
Cant Hooks, "Blue Line"....℔ doz $16.00
Cant Hooks, Common Finish..℔ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish....℔ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish....℔ doz $14.00
Cant Hooks, Clip Clasp, Common Finish....℔ doz $12.00
Hand Spikes....℔ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ℔ doz., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ℔ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ℔ doz, 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ℔ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks....℔ doz $18.00

Lustro—
Four-ounce Bottles....℔ doz, $1.75; ℔ gross....$17.00

Mallets—
Hickory....20&10@20&10&10%
Lignumvitæ....20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 30@30&10%

Match Safes—
Dangerfield's Self-Igniting...℔ doz $1.5

Mattocks. Regular list....60@60&10%

Meat Cutters—
Dixon's ℔ doz....40&5%

Nos.	1	2	3	1
	$14.00	$17.00		$30.00

Woodruff's ℔ doz....40&5%

Nos.		100	150
		$15.00	$18.00

Champion ℔ doz....40&45%

Nos.	200	300	400
	$22.00	$27.00	$40.00

Hales Pattern ℔ doz....70@70&5%

Nos.	11	12	13
	$27.00	$33.00	$45.00

American....30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Enterprise....30%

Nos.	10	12	22	32	42
Each	$3	$2.50	$4	$6	$15

Pennsylvania....40&10%

Nos.	1	2	3	00
℔ doz	$24.00	$28.00	$36.00	$28.00

Miles' Challenge ℔ doz....45@45&10%

Nos.	1	2	3
	$22.00	$30.00	$40.00

Home No. 1....℔ doz, $26.00, 55&10%
Draw Cut, each:

Nos.	5	2	6	8	
	$50	$75	$80	$225	20@25%

Beef Shavers (Enterprise)....20&10@30%
Chadborn's Smoked Beef Cutter. ℔ doz $66.00

Mincing Knives—
Am. (2d quality), ℔ gr., 1 blade, $7; 2 blades, $12; 3 blades, $18....net
Lothrop's....20&10%
Smith's, ℔ doz, Single, $2.00: Double, $3 40@45%
Knapp & Cowles....50&10@60%
Buffalo Adjustable. ....℔ doz. $3.00, 25%

Molasses Gates—
Stebbin's Pat. ..... 70@70&7½%
Stebbin's Genuine ..... 60&10&10%
Stebbin's Tinned Ends ..... 40&10%
Chase's Hard Metal ..... 50&10%
Bush's 20%
Lincoln's Pattern ..... 70@70&10
Weed's ..... 20&10%
Boss, ₱ doz:
Nos. 1, $7; No. 2, $8; No. 3, $9; No. 4 $10 ..... 60&10&10%

Money Drawers....₱ doz, $18@$20

Muzzles—
Safety ..... ₱ doz, $3.00, 25 %

Nails, see Trade Report.
Wire Nails, Papered.
Association list, July 15, 1889 ..... 70&10&10@70&10&10&5%
Tack Mfrs.' list ..... 70@70&5%
Wire Nails, Standard Penny.
Card June 1, '89, base ..... $2.40@$2.50

Nail Puller—
Curtiss Hammer ..... ₱ doz $9.00
Giant, No. 1 ..... ₱ doz. $30.00, 10%
Pelican ..... ₱ doz, $9.00, 25%
Boss ..... ₱ doz, $30.00, 30%
Lightning ..... ₱ doz $21.00

Nail Sets—
Square ..... ₱ gr., $4.00@$4.25
Round ..... ₱ gr. $3.25
Cannon's Diamond Point ..₱ gr., $12, 20%

Nut Crackers—
Table (H. & B. Mfg. Co.) 40%
Blake's Pattern ..... ₱ doz $2.00, 10%
Turner & Seymour Mfg. Co 50%

Nuts—
Nuts, off list Jan. 1, 1888: Square. Hex.
Hot Pressed ..... 5.4¢ 5.9¢
Cold Punched ..... 5.4¢ 5.5¢
In lots less than 100 ₱ ₱, add ½¢; 1-₱ boxes, add 1¢ to list.

Oakum—
Government ..... ₱ ₱ 7½@7⅝¢
U. S. Navy ..... ₱ ₱ 6½@6⅝¢
Navy ..... ₱ ₱ 5½¢@5⅝¢

Oilers—
Zinc and Tin ..... 65@65&10%
Brass and Copper ..... 50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₱ doz. 10@10&10%
Malleable, Hammers, Old Pattern, same list 40%
Prior's Pat. or "Paragon" Zinc, 60&10&10%
Prior's Pat. or "Paragon" Brass 50%
Olmstead's Tin and Zinc 60%
Olmstead's Brass and Copper 50%
Broughton's Zinc 60%
Broughton's Brass 50%
Gem P. D. & Co. ..... ₱ gro. $2

Packing, Steam—
Rubber—
Standard ..... 60&10@60&10&10%
Extra ..... 50&10@60%
N. Y. B. & P. Co., Standard ..50&10&5%
N. Y. B. & P. Co., Empire 70%
N. Y. B. & P. Co., Salamander. ₱ ₱ 65¢, 30%
Jenkins' Standard ..... ₱ ₱ 80¢, 35%
Miscellaneous—
American Packing ..... 10¢@11¢ ₱ ₱
Russia Packing ..... 14¢ ₱ ₱
Italian Packing ..... 13¢@14¢ ₱ ₱
Cotton Packing ..... 15¢@17¢ ₱ ₱
Jute ..... 7¢@8¢ ₱ ₱

Padlocks—
See Locks.

Pails—
Galvanized Iron—

Quarts	10	12	14
Hill's Light Weight, ₱ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ₱ ds.	3.00	3.25	3.75
Whiting's	2.75	3.00	3.25
Sidney Shephard & Co.	2.80	3.00	3.40
Iron Clad	2.75	3.00	3.25
Fire Buckets	2.75	3.25	3.50

Buckets, see Well Buckets.
Indurated Fibre Ware—25 %
Star Pails, 12 qt ..... ₱ doz $6.00
Fire, Stable and Milk, 14 qt .. ₱ doz $7.80
Standard Fibre Ware—

	Plain.	Decr'd
Water Pails, 12 qt., per doz.	$4.00	$4.50
Dairy Pails, 14 qt., per doz.	4.50	5.00
Fire Pails, No. 1, 12 qt. per doz	5.00	
Fire Pails, No. 2, 14 qt. per doz	4.50	

Pencils—
Faber's Carpenters' ..... high list 50%
Faber's Round Glit ..... ₱ gro $5.25
Dixon's Lead ..... ₱ gro $4.50
Dixon's Lumber ..... ₱ gro $6.75
Dixon's Carpenters' ..... 40&10%

Picks—
Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00 ..... 60 @ 60&10%

Picture Nails—
Brass Head, Sargent's list ..... 50&10&10%
Brass Head, Combination list ..... 50&10%
Porcelain Head, Sargent's list. 50&10&10%
Porcelain Head, Combination list. 40&10%
Niles' Patent 40%

Pinking Irons— ₱ doz 65¢ net

Pipe, Wrought Iron—
List March 23, 1887.
1¼ and under, Plain 50%
1¼ and under, Galvanized 42½%
1½ and over, Plain 62½%
1½ and over, Galvanized 50%
Boiler Tubes, Iron.
1¾ and under 52½%
2 in. and larger 57½%

Planes and Plane Irons—
Wood Planes—
Molding ..... 50&10&60%
Bench, First Quality ..... 60@60&5%
Bench, Second Quality ..... 60&10&10@70%
Bailey's (Stanley R. & L. Co.) ..... 40&10%
Iron Planes—
Bailey's (Stanley R. & L. Co.) ..... 40@10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 20&10%
Victor Planes (Stanley R. & L. Co.) .20&10%
Steer's Iron Planes ..... 35@35&5%
Meriden Mal. Iron Co.'s .30@10@30&10&10%
Davis's Iron Planes ..30@10@30&10&10%
Birmingham Plane Co. ..... 50@50&5%
Gage Tool Co.'s Self-Setting ..... 20&10%
Chaplin's Iron Planes ..... 40@40&5%
Sargent's ..... 30@10@30&10&10%
Plane Irons—
Plane Irons ..... 20&10%
Plane Irons, Butcher's ..$5.00@$5.25 to £
Plane Irons, Buck Bros 30%
Plane Irons, Auburn Tool Co., "Thistle" 40%
Sandusky Tool Co.:
Single and Cut 30%
Double 40%
L. & I. J. White 25%

Pliers and Nippers—
Button's Patent ..... 30&10@40%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₱ doz ..... 20&10@33⅓%
Humason & Beckley Mfg. Co. .50@50&10%
Gas Pliers 60%
Gas Pliers, Clustar's Nickel Plated. .60&5%
Eureka Pliers and Nippers 40%
Russell's Parallel 25%
P. S. & W. Cast Steel 50%
P. S. & W. Tinners' Cutting Nippers, add 6% dis 10%
Carew's Pat. Wire Cutters 20%
Morrill's Parallel, ₱ doz, $12.00 ..30&5%
Cronk's 8 in., $15.00; 10 in. $21.00, 40@40&5%

Plumbs and Levels—
Regular List ..... 70&10@70&10&10%
Disston's ..... 45&10%
Pocket Levels ..... 70&10@70&10&10%
Davis Iron Levels 30%
Davis' Inclinometers ..... 10&10%

Polish, Metal.
Prestoline ..... 20&10%
Krestoline Paste 33⅓%
Gaston's Silver Compound 33⅓%

Pokes, Animal—
Bishop's I. X. L. ..... ₱ doz $6.50
Bishop's O. K. ..... ₱ doz $5.50
Bishop's Pioneer ..... ₱ doz $3.75
Bishop's American ..... ₱ doz $3.00

Poppers, Corn—
Round or Square, 1 qt.. ₱ gr $12.00@15.00
Round or Square, 2 qt.. ₱ gr $25.00@26.00

Post Hole and Tree Augers and Diggers—
Samson Post Hole Digger, ₱ doz $36.00. 25&10%
Fletcher Post Hole Augers, ₱ doz $36, 20%
Eureka Diggers ..... ₱ doz $16.00@17.00
Leed's ..... ₱ doz $8.00@9.00
Vaughan's Post Hole Auger, ₱ doz $13.00@14.00
Kohler's Little Giant ..... ₱ doz $18.00
Kohler's Hercules ..... ₱ doz $15.00
Kohler's New Champion ..... ₱ doz $9.00
Schneidler ..... ₱ doz $18.00
Ryan's Post Hole Diggers ..₱ doz $24.00
Cronk's Post Bars, ₱ doz $60.00, 50&5@50&10%
Gibbs Post Hole Digger, ₱ doz $30.00, 50%
Imperial, ₱ doz, $15 ..... 45%

Potato Parers—
White Mountain ..... ₱ doz $5.00@5.50
Antrim Combination ..... ₱ doz $8.00
Hoosier ..... ₱ doz $13.50

Pruning Hooks and Shears—
Disston's Combined Pruning Hook and Saw ..... ₱ doz $18.00, 20&10%
Disston's Pruning Hook, ₱ doz $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools 40%
Pruning Shears, Henry's Pat, ₱ doz $3.75@4.00 net
Henry's Pruning Shears, ₱ doz $4.25@4.50 net
Wheeler, M. & C. Co.'s Combination, ₱ doz $12.00, 20%
Dunlap's Saw and Chisel, ₱ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2, 7.25

Pulleys—
Hot House, Awning, &c. ..... 60&10%
Japanned Screw ..... 60&10%
Brass Screw ..... 60&10%
Japanned Side ..... 66⅔&10%
Japanned Clothes Line ..... 60&10%
Empire Sash Pulley ..... 55&60%
Moore's Sash, Anti-Friction 50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50 ..... 50&10&50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70 ..... 50%
Hay Fork, "₱" Common and Pat. Bushed 20%
Hay Fork, Tarbox Pat. Iron 20%
Hay Fork, Reed's Self-Lubricating ..60%
Shade Rack 45%
Tackle Blocks ..... See Blocks
Moore's Anti-Friction 5 in. Wheel, ₱ doz $12.00 ..... 40%

Pumps—
Cistern, Best Makers ..... 60@60&10%
Pitcher Spout, Best Makers ....67½@70%
Pitcher Spout, Cheaper Goods. 70@70&5%

Punches—
Saddlers' or Drive, good, ₱ doz ...60@65¢
Bemis & Call Co.'s Cast Steel Drive. .50&5%
Bemis & Call Co's Springfield Socket. 50&5%
Spring, good quality .... ₱ doz $2.50@2.60
Spring, Leach's Pat 15%
Bemis & Call Co.'s Spring and Check . 40%
Solid Tinners' ..... ₱ doz $1.44, 55%
Tinners' Hollow Punches ..... 20&2%
Rice Hand Punches 15%
Avery's Revolving 40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—
Sliding Door, W'r't Brass, ₱ ₱ 35¢ 15%
Sliding Door, Bronzed W'r't Iron .. ₱ ft. 7¢
Sliding Door, Iron, Painted, ₱ foot 4¢, 40%
Barn Door, Light. In. ½ ⅝ ¾
Per 100 feet $2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—

	Small.	Med.	Large.
Per 100 feet	$2.15	2.70	3.25..net

Terry's Wrought Iron, ₱ foot ..... 4¼@5¢
Victor Track Rail, 7¢ ₱ foot ..... 50&2%
Carrier Steel Rail, ₱ foot ..... 4¼¢
Moore's Wrought Iron 25%

Rakes—
Cast Steel, Association goods 65%
Cast Steel, outside goods ..... 60&10@70%
Malleable ..... 70@70&5%
Gibbs Lawn Rake ..... $12.00, 50&15%
Canton Lawn Rake ..... $9.00, 50&10%
Ft. Madison Prize Bow Brace and Peerless 65%
Fort Madison Steel Tooth Lawn Rake, $6.00 ..... 25%

Razors—
J. R. Torrey Razor Co 20%
Wostenholme and Butcher, $10.00 to £, 10%

Razor Strops—
Genuine Emerson ..... 60@60&5%
Imitation " .... ₱ doz $2.00, 20&10&5%
Torrey's 20%
Badger's Belt and Com ..... ₱ doz $2.00
Lamont Combination ..... ₱ doz $4.00

Rivets and Burrs—
Iron, list Nov. 17, '87 ..... 50%
Copper ..... 50&10@60%

Rivet Sets ..... 50&10%

Rods—
Stair, Brass ..... 25&2%
Stair, Black Walnut .. .. ₱ doz 40¢

Rollers—
Barn Door, Sargent's list ..... 60&10&10%
Acme Moore's Anti-Friction 55%
Union Barn Door Roller 70%

Rope—
Manufacturers' prices for large lots:
Manila..½ in. and larger ₱ ₱ 13 ¢
Manila ..... ⅜ in. ₱ ₱ 13½¢
Manila ..... ¼ and 5-16 in. ₱ ₱ 13⅝¢
Manila, Tarred Rope ..... ₱ ₱ 12½¢
Manila, Hay Rope ..... ₱ ₱ 13 ¢
Sisal..½ inch and larger ₱ ₱ 11 ¢
Sisal ..... ⅜ in. ₱ ₱ 11½¢
Sisal ..... ¼ and 5-16 in. ₱ ₱ 11¾¢
Sisal, Hay Rope ..... ₱ ₱ 11 ¢
Sisal, Tarred Rope ..... ₱ ₱ 10½¢
Sisal, Medium Lathe Yarn. ₱ ₱ 10 ¢
Cotton Rope ..... ₱ ₱ 15@18¢ net
Jute Rope ..... ₱ ₱ 8¢
1½% for cash in 10 days.

Rules—
Boxwood ..... 80&10&10@80&10&10&5%
Ivory ..... 50@50&10%
Starrett's Rules and Straight Edges, Steel ..... 25&10%

Sad Irons—
From 4 to 10, at factory ...₱ 100 ₱, $2.40@$2.55
Self-Heating ..... ₱ doz $9.00 net
Self-Heating, Tailors' ..₱ doz $18.00 net
Gleason's Shield and Toilet 25%
Mrs. Pott's Irons ..... 40@40&10%
Enterprise Star Irons 40%
Combined Fluter and Sad Iron, ₱ doz, $15.00 ..... 15%
Fox Reversible, Self-Fluter ₱ doz $24.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England ..... 5¢, 15%
Mahony's Troy Pol. Irons 25%
Sensible ..... 20@20&5%
National Self-Heating ..... 30 %

Sand and Emery Paper and Cloth—
List April 19, 1886 ..... 50@50&10%
Sibley's Emery and Crocus Cloth 30%

Sash Cord—
Common ..... ₱ ₱, 10@11¢
Patent, good quality ..... ₱ ₱ 13@13½¢
White Cotton Braided, fair.. ₱ ₱ 28@29¢
Common Russia Sash ..... ₱ ₱ 13½¢
Patent " " ..... ₱ ₱ 15¢
Cable Laid Italian Sash ..... ₱ ₱ 22¢@23¢
India Cable Laid " ..... ₱ ₱ 13¢
Silver Lake—
A Quality, White, 50¢ ..... 10&10&5%
A Quality, Drab, 55¢ ..... 10&10&5%
B Quality, White, 50¢ ..... 20&10&5%
B Quality, Drab, 55¢ ..... 20&10&5%
C Quality, White (only) ..... 26½¢@28¢
Sylvan Spring, Extra Braided, White, 34¢
Sylvan Spring, Extra Braided, Drab. .39¢
Semper Idem, Braided, White ..... 30¢
Egyptian, India Hemp, Braided ..... 25¢
Samson—
Braided, White Cotton, 50¢. .30@30&5%
Braided, Drab Cotton, 55¢. ..30@30&5%
Braided, Italian Hemp, 55¢. .30@30&5%
Braided, Linen, 80¢ ..... 30@30&5%

Sash Locks—
Clark's, No. 1, $10; No. 2, $8 ₱ gr. .33⅓%
Ferguson's 33⅓%
Morris and Triumph, list Aug. 16, 1886, 60&2%
Victor ..... 60&10&2%
Walker's 10%
Attwell Mfg. Co. ..... 25&33⅓%
Reading ..... 66⅔&10@66⅔&10&10%
Hammond's Window Springs 40%
Common Sense, Jap'd, Cop'd and Br'zed ..... ₱ gr $4.00
Common Sense, Nickel Plated ..... ₱ gr $10.00
Universal 30%
Kempshall's Gravity 60%
Kempshall's Model ..... 60&60&10%
Corbin's Daisy, list Feb. 15, 1886 ..... 70%
Payson's Perfect ..... 60&60&10%
Hugunin's Sash Balances ..... 25&5&5%
Hugunin's New Sash Locks ..... 25&5&2%
Stoddard "Practical" 10%
Ives' Patent ..... 60@60&10%
Liesche's, Nos. 100 and 110, ₱ gr $8; 105, $10.00 ..... 20&10%
Davis, Bronze, Barnes Mfg. Co. 50%
Champion Safety, list March 1, 1888 ..... 50&55&5%
Security 70%
Buckeye ..... ₱ gro $4.80

Sash Weights—
Solid Eyes ..... ₱ ton $22.00

Sausage Stuffers or Fillers—
Miles' "Challenge," ₱ doz $20, 50&50&5%
Ferry ..... ₱ doz, No. 1, $15.00; No. 0, $21.00 ..... 50&5@50&10%
Draw Cut No. 4, each $30.00 ..... 20%
Enterprise Mfg. Co. ..... 20&10&30%
Silver's ..... 40&10%

Saws—
Disston's Circular ..... 45@45&5% } Extras sometimes given by jobbers.
Disston's Cross Cuts ..... 45@45&5% }
Disston's Hand 25@25&5%
Atkins' Circular Shingle and Heading 50&10%
Atkins' Silver Steel Diamond X Cuts ₱ foot 70¢
Atkins' Special Steel Dexter X Cuts ₱ foot 50¢
Atkins' Special Steel Diamond X Cuts ₱ foot 30¢
Atkins' Champion and Electric Tooth X Cuts ..... ₱ foot 24@25¢
Atkins' Hollow Back X Cuts. .₱ foot 18¢
Atkins' Mulay, Mill and Drag ..... 40&10%
Atkins' One-Man Saw, with handles, ₱ foot 32¢
W. M. & C., Hand ..... 30&5@30&10%
W. M. & C., Champion X Cuts, Regular ..... ₱ foot 24@26¢
W. M. & C. X Cuts, Thin Back ..... ₱ foot 27@29¢
Peace Circular and Mill ..... 45&10%
Peace Hand Panel and Rip 20&10@20&10&10%
Peace Cross Cuts, Standard .. ₱ foot 25¢
Peace Cross Cuts, Thin Back ₱ foot 27@28¢
Richardson's Circular and Mill 45@45&10%
Richardson's X Cuts, No. 1, 39¢; No. 2, 27¢; No. 3, 24¢
Hack Saws—
Griffin's, complete ..... 40&10@50%
Griffin's Hack Saw, Blades ....40&10@50%
Star Hack Saws and Blades 25%
Diamond Hack Saws and Blades 25%
Eureka and Crescent 25%

Saw Frames—
White Vermont ..... ₱ gro $9.00@10.00
Red, Polished and Varnished ..... ₱ doz $1.50, 25%

Saw Sets—
Stillman's Genuine ..₱ doz $5.00@7.75, 40&5%
Stillman's Imita ..... ₱ doz $3.25@5.25, 40&5@40&10%
Common Lever ..... ₱ doz $2.00, 40&5%
Morrill's No. 1, $15.00; Nos. 3&4, $24.00, 40&10@50%
Leach's ..No. 0, $8.00; No. 1, $15, 15@20%
Nash's ..... 20&10@20&10&10%
Hammer, Hotchkiss $5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 30&5%
Bemis & Call Co.'s Lever and Spring Hammer ..... 30&5%
Bemis & Call Co.'s Plate 10%
Bemis & Call Co.'s Cross Cut 13⅓%
Aiken's Genuine ..... $13.00, 50&10%
Aiken's Imitation ..... $7.00, 55&5%
Hart's Pat. Lever 20%
Disston's Star, ₱9, No. 15, $5.50; 20& 10@20&10&10%
Atkin's Lever, ₱ doz No. 1, $6.00; No. 2, $9.00
Atkin's Criterion ..... ₱ doz $7.50
Croissant (Keller), No. 1, $15.00; No. 2, $24.00 ..... 40&10%
Avery's Saw Set and Punch 50%
Am. Tool Co.'s Superior ..... ₱ doz $15,50%

Saw Tools—
Atkins' Perfection ..... ₱ doz $15.00
Atkins' Excelsior ..... ₱ doz $6.00
Atkins' Giant ..... ₱ doz $4.00

Scales—
Hatch, Counter, No. 171, good quality, ₱ doz $21.00
Hatch, Tea, No. 161 .... ₱ doz $6.75@$7.00
Union Platform, Plain ..... $2.10@2.20
Union Platform, Striped ..... $2.20@2.30
Chatillon's Grocers' Trip Scales 50%
Chatillon's Eureka 25%
Chatillon's Favorite 40%
Family, Turnbulls ..... 30@30&10%
Riehle bros.' Platform 40%

Scale Beams—
Scale Beams, List Jan. 12, '82 ..50&10@ 50&10&5%
Chatillon's No. 1 ..... 40%
Chatillon's No. 2 ..... 50%

Scrapers—
Adjustable Box Scraper (S. R. & L. Co.) $6.50 ..... 30&10%
Box, 1 Handle ..... ₱ doz $4.00. 10%
Box, 2 Handle ..... ₱ doz $6.00, 10%
Defiance Box and Ship ..... 20&10%
Foot ..... 50&10@60%
Ship, Common ..... ₱ doz $3.50 net
Ship, R. I. Tool Co. 10%

Screen Window and Door Frames—
Porter's Pat. Window and Door Frame. 33⅓&10%
Warner's Screen Corner Irons ..33⅓% 33⅓&10%
Stearns' Frames and Corners .25@25&10%

Screw Drivers—
Douglas Mfg. Co. ..... 20&10&10%
Disston's ..... 45&10%
Disston's Pat. Excelsior ..... 45&10%
Buck Bros. 30%
Stanley R. & L. Co.'s Varnished Handles ..... 65&10% Black Handles ..... 60&10%
Sargent & Co.'s No. 1 Forged Blade ..... 60&10&10% Nos. 20, 30 and 60 ..... 66⅔&10&10%
Knapp & Cowles' No. 1 ..... 60&20@70% No. 1 Extra ..... 60@60&10% Nos. 00 & 4 ..... 50&5@50&10&5%
Stearns' ..... 25&10&10%
Gay & Parsons 35%
Champion ..... 25&10%
Clark's Pat ..... 30@33⅓%
Crawford's Adjustable 30%
Ellrich's Socket and Ratchet ..25@25&10%
Allard's Spiral, new list 25%
Kolb's Common Sense ₱ doz $6.00, 25&10%
Syracuse Screw-Driver Bits ....30&30&5%
Screw Driver Bits ..... ₱ doz 50&75¢
Screw-Driver Bits, Parr's ..... ₱ gro $6.25
Fray's Hol. Hdle. Sets. No. 3, $12.00, 25@25&10%
P. D. & Co.'s all Steel 50%

Screws—
Wood Screws—List March 1, 1889

Flat Head Iron	50%
Round Head Iron	40%
Flat Head Brass	45%
Round Head Brass	35%
Flat Head Bronze	45%
Round Head Bronze	35%

Extra 5 @ 10 % often given

Machine—
Flat Head, Iron.....55%
Round Head, Iron.....50%
Bench and Hand—
Bench, Iron.....55&10@55&10&10%
Bench, Wood, Beech.....₱ doz $2.25
Bench, Wood, Hickory.....20&10%
Hand, Wood.....25&10@25&10&5%
Lag, Blunt Point, according to size.....80@80&5%
Coach and Lag, Gimlet Point.....75%
Bed.....25&5%
Hand Rail, Sargent's.....66⅔&10%
Hand Rail, H. & B. Mfg. Co...70&10@75%
Hand Rail, Am. Screw Co.....75%
Jack Screws, Millers Falls list..50@50&5%
Jack Screws, P. S. & W.....35%
Jack Screws, Sargent...60&10@60&10&5%
Jack Screws Stearns'.....40@40&10%

Scroll Saws—

Lester, complete, $10.00.....25%
Rogers, complete, $4.00.....25%
Barnes' Builders' and Cabinet Makers', $15.....25%
Barnes' Scroll Saw Blades.....35%

Scythe Snaths.....50&2%

Shears—

American (Cast) Iron...75&10@75&10&5%
Pruning...See Pruing Hooks and Shears.
Barnard's Lamp Trimmers...₱ doz $3.75
Tinners'.....20&2%
Seymour's, List, Dec., 1881.
60&10&10@60&10&10&5%
Heinisch's, List, Dec., 1881.
60&10&10@60&10&10&5%
Heinisch's Tailor's Shears.....33⅓&5
First quality C. S. Trimmers..80@80&10%
Second quality C. S. Trimmers.
80&10@80&10&10%
Acme Cast Shears.....10&10%
Diamond Cast Shears.....10%
Clipper.....10&10%
Victor Cast Shears.....75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel.....40%
Chicago Drop Forge & F. Co., Solid Steel Forged.....60%
Clauss Shear Co., Japanned.....70%
Clauss Shear Co., Nickeled, same list.60%

Sheaves—

Sliding Door—
M. W. Co., list July, 1888..50&10@60&5%
R. & E., list Dec. 18, 1885.....55&20%
Corbin's list.....60&10&2%
Patent Roller.....60&10&2%
Patent Roller, Hatfield's.....75%
Russell's Anti-Friction, list Dec. 18, 1885.....60&2%
Moore's Anti-Friction.....50%
Sliding Shutter—
R. & E. list Dec. 18, 1885.....60&10&2%
Sargent's list.....60&10%
Reading list.....60&10&10%

Ship Tools—

L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%

Shoes, Horse, Mule, &c.—

Horse—
Burden's, Perkins', Phœnix, at factory, $4.00
Mule—
Add $1 ₱ keg to above prices.
Ox, Wrought—
Ton lots.....₱ ℔ 9¢
1000 ℔ lots.....₱ ℔ 9½¢
500 ℔ lots.....₱ ℔ 10¢

Shot—

(Eastern prices 2¢ off, cash, 5 days.
Drop, ₱ bag, 25 ℔.....$1.25
Drop, ₱ bag, 5 ℔.....30
Buck and Chilled, ₱ 25-℔ bag.....1.50
Buck and Chilled, ₱ 5-℔ bag.....35

Shovels and Spades—

Ames' Shovels, Spades, &c., list Nov. 1, 1885.....20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron.....50&10%
Griffith's C. S.....60&60&10%
Griffith's Solid C. S. R. R. Goods.....20%
Old Colony (Sanford Fork & Tool Co).20%
St. Louis Shovel Co.....20@20@7½%
Hussey, Binns & Co.....15@25%
Hubbard & Co.....30@20@7½%
Lehigh Mfg. Co.....50&10%
Payne Pettebone & Son, list January, 1886.....30%
Remington's (Lowman's Pat.)30&10@40%
Rowland's, Black Iron.....50&10%
Rowland's Steel.....60&5@60&10%

Shovels and Tongs—

Iron Head.....60&10@60&10&5%
Brass Head.....60&10&10%

Skeins, Thimble—

Western list.....75&5@75&10%
Columbus Wrt. Steel, list Nov. 1, 1887.20%
Coldbrookdale Iron Co.....50&10%
Utica P. S. T. Skeins.....60%
Utica Turned and Fitted.....35%

Sieves—

Buffalo Metallic, S. S. & Co...50&25&10%
Shaker (Barler's Pat.) Flour Sifters.... ₱ doz $2.00; ₱ gr $21.00
Electric.....₱ gr $18.00
Hunter's.....₱ gr $21.00
Smith's Adjustable Sifters....₱ doz $2.00
Smith's Adjustable Milk Strainer. ₱ doz $2.00
Smith's Adjustable T. & C. Strainer. ₱ doz. $1.25

Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ₱ doz..	70¢	90¢
Mesh 20, Nested, ₱ doz..	85¢	$1.00
Mesh 24, Nested, ₱ doz..	$1.00	1.10

Slates—

School, by case.....40%

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.).....65%
Fitch's (Bristol).....50&10%
Hotchkiss.....10%
Andrews.....50%
Sargent's Patent Guarded.....70&10&10%
German, new list.....40&10%
Covert.....50&2%
Covert, New Patent.....50&5&2%
Covert, New R. E.....60&10&2%
Covered Spring.....60&10&10%

Soldering Irons—

Covert's Adjustable, list Jan. 1, 1886. 35&2%

Spoke Shaves—

Iron.....45%
Wood.....30%
Bailey's (Stanley R. & L. Co.).....40&10%
Stearns'.....20&10@30%

Spoke Trimmers—

Bonney's.....₱ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₱ doz.
Douglas'.....55&10%
.....₱ doz $9.00, 20%

Spoons and Forks—

Tinned Iron—
Basting, Cen. Stamp. Co.'s list....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....70&10%
Buffalo S. S. & Co.....33⅓&2%
Silver-Plated—(4 mos. or 5% cash 30 days).
Meriden Brit. Co., Rogers.....50%
C. Rogers & Bros.....50%
Rogers & Bro.....50%
Reed & Barton.....50%
Wm. Rogers Mfg. Co.....50&10@60%
Simpson, Hall, Miller & Co.....50&10
Holmes & Edwards Silver Co...60@60&5%
L. Boardman & Son.....60&10%
Miscellaneous.
Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50&10&5%
No. 30 Silver Metal.....50&10&5%
No. 24 German Silver.....50&10&5%
No. 50 Nickel Silver.....50%
No. 49 Nickel Silver.....50&10
German Silver.....50@50&5
German Silver, Hall & Elton..50&5% cash
Nickel Silver.....50&5@50&10&5% cash
Britannia.....90%
Boardman's Nickel Silver.....50 } 1 mos.
Boardman's Britannia Spoons, case lots.....60 } 4 mos.

Springs—

Elliptic, Concord, Platform and Half Scroll.....60@60&5%
Cliff's Bolster Springs.....25%

Squares—

Steel and Iron.....} 75&10@80%,
Nickel-Plated.....} full cs. ex. 10%
Try Square and T Bevels...60&10@60&10, &10%
Disston's Try Square and T Bevels.45&10%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares.....40%
Avery's Bevel Protractor.....50%

Standard Fibre Ware—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10½ in.....	$2.00	$2.25
Wash-Basins, 12 in.....	2.25	2.75
Keelers, 11½ in.....		4.00
Cuspidors.....		8.00
Spittoons, "Daisy," 8 in....	4.00	4.50
Peck Measure.....	4.00	
Half-peck Measure.....	3.50	

See also Pails.

Staples—

Fence Staples, Galvanized.} Same price
Fence Staples, Plain.....} as B'rb Wire. See Trd. Rep.

Steelyards.....40&10@50%

Stocks and Dies—

Blacksmith's
Waterford Goods.....30&5@30&10%
Butterfield's Goods.....30&5@30&10%
Lightning Screw Plate.....25&30%
Reece's New Screw Plates...33⅓&5&40%
Reversible Ratchet.....30 %

Stone—

Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 4½¢
Sand Stone.....₱ ℔ 2¼¢
Washita Stone, Extra.....₱ ℔ 19@20¢
Washita Stone, No. 1.....₱ ℔ 14@15¢
Washita Stone, No. 2.....₱ ℔ 10@11¢
Washita Slips, No. 1, Extra..₱ ℔ 36@38¢
Washita Slips, No. 1.....₱ ℔ 24@25¢
Arkansas Stone, No. 1, 4 to 6 in₱ ℔ $1.50
Arkansas Stone, No. 1, 6 to 9 in₱ ℔ $1.85
Turkey Oil Stone, 4 to 8 in.....₱ ℔ 40¢
Turkey Slips.....₱ ℔ $1.00@1.50
Lake Superior, Chase.....₱ ℔ 16¢
Lake Superior Slips, Chase...₱ ℔ 31@32¢
Seneca Stone, Red Paper Brand....₱ ℔ 18@20¢
Seneca Stone, High Rounds..₱ ℔ 20@25¢
Seneca Stone, Small Whets..₱ gro $24.00

Stove Polish—

Joseph Dixon's.....₱ gro $6.00,10%
Gem.....₱ gro $4.50, 10%
Gold Medal.....₱ gro $6.00, 25%
Mirror.....₱ pro $6.00, —%
Lustro.....₱ gro $4.75
Ruby.....₱ gro $3.75
Rising Sun, 5 gro lots.....₱ gro $5.50
Dixon's Plumbago.....₱ ℔ $5.00
Boynton's Noon Day, ₱ gro.....13.00
Parlor Pride Stove Enamel..₱ gro 8 cans
Yates' Liquid, 2 3 5 10 gal...8¢
₱ gal...$0.90 .80 .70 .60
Yates Standard Paste Polish, 10-℔ cans. ₱ ℔ 15¢
Jet Black.....₱ gro $3.50
Japanese.....₱ gro $3.50
Fireside.....₱ gro $2.50
Diamond O. K. Enamel.....₱ gro $19.00
Bonnell's Liquid Stove Polish..₱ gro $9.00
Bonnell's Paste Stove Polish..₱ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans.....12½¢
Black Jack Water Paste, 5 and 10 ℔ cans.....12½¢
Nickel Plate Paste.....₱ gro $6.00

Tacks, Brads, &c.—

List, Jan. 2, 1888.—[*Note.*—Some manufacturers are selling Tacks at slightly higher prices than those named]:
American Iron Carpet.....80@80&5%
Steel Carpet.....80@80&5%
Swedes Iron Carpet.....80@80&5%
American Iron Cut.....75@75&10%
Swedes Iron.....75&5@75&10%
Swedes Iron, Upholsterers', 75&10@80%
Tinned Swedes Iron.....75&10@80%
Tinned Swedes Iron, Upholsterers', 75&10@80%
Gimp and Lace.....75&10@80%
Tinned Gimp and Lace.....75&10@80%
Swedes Iron Trimmers'.75&10@75&10&5%
Swedes Iron Miners'...75&10@75&10&5%
Swedes Iron Bill Posters' or Railroad, 75&10@75&10&5%
Swedes Steel (Swedes Iron price list), 80@80&5%
Copper Tacks.....50&10%
Copper Finishing, Trunk and Clout Nails.....50&10%
Finishing Nails.....70&10@70&10&5%
Trunk and Clout Nails..70&10@70&10&5%
Tinned Trunk and Clout Nails, 70&10@ 70&10&5%
Basket Nails'.....70&10@70&10&5%
Common and Patent Brads, 70&10@70& 10&5%
Hungarian Nails.....70&10@70&10&5%
Chair Nails.....70&10@70&10&5%
Zinc Glaziers' Points.....50@50&5%
Cigar Box Nails.....50&10@50&10&5%
Picture-Frame Points..50&10@50&10&5%
Looking-Glass Tacks..50&10@50&10&5%
Leathered Carpet.....50&10@50&10&5%
Brush Tacks.....50&10@50&10&5%
Shoe Finders,' List Jan. 2, 1888, 10&10@ 10&10&5%
Lining and Saddle Nails, (List Jan. 1, 1886):
Silvered.....30&10&10%
Japanned.....20&10&10%
Double-Pointed Tacks.....85%
Wire Carpet Nails.....50&10%
Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....50&10%

Tap Borers—

Common and Rind.....20&10%
Ive's Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10@30%
Clark's.....33⅓@35%

Tapes, Measuring—

American.....33⅓@33⅓&5%
Spring.....40%
Chesterman's, Regular list.....25@30%

Thermometers—

Tin Case.....80@80&10%

Thimble Skeins—See Skeins.

Ties, Bale—Steel

Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—

Shears and Snips (P. S. & W.).....20@25%
Punches, see Punches.
Snips, J. Mallinson & Co.....33⅓%

Tinware—

Stamped, Japanned and Pl'sed, list Jan. 20 1887.....75@75&5

Tire Benders, Upsetters, &c—

Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%

Tobacco Cutters—

Champion.....20&10@30%
Wood Bottom.....₱ doz $5.00@$5.25
All Iron.....₱ doz $4.25
Nashua Lock Co.'s ₱ doz, $18.00 50@55%
Wilson's.....55%
Sargent's.....₱ doz, $24, 55&10%
Acme.....₱ doz, $20.00,40%

Transom Lifters—

Wollensak's:
Class 3 and 4, Bronzed Iron.....50%
Class 3 and 4, Bronze Metal.....25%
Class 3 and 4, Brass.....35%
Skylight Lifters.....35%
Crown, Eagle and Shield.....50%
Relher's, list Jan. 1, 1887-
Bronzed Iron Rods.....50&10&2
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's Universal.....40@40&10%

Traps—

Game—
Newhouse.....35@40&5%
Oneida Pattern.....70@70&5%
Game, Blake's Patent.....40&10&5%
Mouse and Rat—
Mouse Wood,Choker, ₱ doz holes, 11@12¢
Mouse, Round Wire.....₱ doz $1.50, 10%
Mouse, Cage, Wire.....₱ doz $2.50, 10%
Mouse, Catch-'em-alive....₱ dz $2.50, 15%
Mouse, Bonanza.....₱ gr $10.00
Mouse Delusion.....₱ gr $15.00
Rat, Decoy.....₱ gr $10.00, 10%
Ideal.....₱ gr $10.00
Cyclone.....₱ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₱ doz 90¢
In full cases.....₱ doz 75¢

Trowels—

Lothrop's Brick and Plastering.25@25&5%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering, 25@25&10%
Peace's Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Triers—

Butter and cheese.....25%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—

See Pipe.

Twine—

Flax Twine—	BC.	B.
No. 9, ¼ and ⅛ ℔ Balls.....	22¢	30¢
No. 12, ¼ and ⅛ ℔ Balls.....	21¢	29¢
No. 18, ¼ and ⅛ ℔ Balls.....	18¢	28¢
No. 24, ¼ and ⅛ ℔ Balls.....	18¢	28¢
No. 36, ¼ and ⅛ ℔ Balls.....	16¢	27¢
No. 264, Mattrass, ¼ and ⅛ ℔ Balls.	48@50¢	
Chalk Line, Cotton, ⅛ ℔ Balls.....	25¢	
Mason Line, Linen, ⅛ ℔ Balls.....	55¢	
2-Ply Hemp, ¼ and ⅛ ℔ Balls (Spring Twine).....	11¼¢	
3-Ply Hemp, 1 ℔ Balls.....	12¢@12¼¢	
3-Ply Hemp, 1½ ℔ Balls.....	11¢@11¼¢	
Cotton Wrapping, 5 Balls to ℔ ..	15¢@16¢	
2, 3, 4 and 5-Ply Jute, ⅛ ℔ Balls.....	10¢	
Wool.....	6¾¢@6¾¢	
Paper.....	13¢@14¢	
Cotton Mops, 6, 9, 12 and 15 ℔ to doz..	18¢	

Vises—

Solid Box.....60@60&5%
Parallel—
Fisher & Norris Double Screw.....15&10%
Stephens'.....25&30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Sargent's.....60&10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20%
Saw Filers—
Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓&35%
Sargent's.....66⅔&10%
Hopkins'.....₱ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Combination Hand Vises.....₱ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%

Wagon Boxes—

Per ℔.....2½¢

Wagon Jacks—

Daisy.....25%

Washer Cutters—

Smith's Pat.....₱ doz $12.00, 20&10&10%
Johnson's.....₱ doz $11.00, 33⅓&5
Penny's,₱ doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₱ doz $16.00, 60&10%
Bonney's.....30&10%

Washers—

Size.....	½	5-16	⅜	½	⅝	¾	1
Washers....	6½	5½	4½	3½	3	3	3

In lots less than 200 ℔, ₱ ℔, add ¼¢, 5-℔ boxes 1¢ to list.

Wedges—

Iron.....₱ ℔ 3½¢
Steel.....₱ ℔ 4 ¢

Well Buckets, Galvanized—

Hill's.....₱ doz, 12 qt, $4.25; 14 qt, $5.25
Iron Clad.....₱ doz, 14 qt, $4.25@$4.50
Whiting's Flat Iron Band.....$4.25@4.50
Whiting's Wired Top..₱ doz $4.00@.4.25

Well Wheels—

8 in., $2.25; 10 in., $2.70; 12 in., $3.25

Wire—

Iron—
Market,
Br. & Ann., Nos. 0 to 18....75@75&10%
Cop'd, Nos. 0 to 18.....70@70&10%
Galv., Nos.'0 to 18.....25&10%
Tin'd, Tinned list Nos. 0 to 18.....70%
Stone,
Br. and Ann'd, Nos. 16 to 18, 72½@ 75@75&5%
Bright and Ann'd, Nos. 19 to 26, 75@ 75&10%
Br. and Ann'd, Nos. 27 to 36.....80%
Tinned.....70&10@75%
Tinned Broom Wire.....70&10@75%
Galvanized Fence.....65&5%
Annealed Fence, Nos. 8 and 9.....75&5%
Annealed Grape, Nos. 10 to 14.....75&5%
Brass, list Jan. 18, 1884.....25@30%
Copper, list Jan. 18, 1884.....30 @ 35%
Barb Fence.....See Trade Report
Wire on Spools.....65%
Malin's Steel and Tin'd Wire on Spools, 40%
Malin's Brass and Cop. Wire on Spools 30%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to 2, 30%
Steel Music Wire, Nos. 12 to 30..55¢ ₱
Picture Wire.....New list, 50%
Barb Wire Safety Guards, ₱ 1000, $9.00, 25%
Wire Clothes Lines, see Lines.

Wire Cloth, Netting, &c.—

Painted Screen Cloth, good quality, ₱ 100 sq. ft., $1.80 @ $1.90
Galvanized Wire Netting.....75@75&5%

Wire Goods—

See Bright Wire Goods.

Wire Rope—

List May 1, 1886.
Iron.....30%
Cast Steel.....40%

Wrenches—

American Adjustable.....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....55&3%
Coes' "Mechanics".....55&10&3%
Girard Standard.....70&10%
Machinists', Sterling Wrench Co..70&10%
Lamson & Sessions' Engineers'...60&10%
Lamson & Sessions' Standard.....70&10%
Goes' Pattern, Wrought.....
Girard Agricultural.....
Lamson & Sessions' Agric'l..} 75&10&5 @ 80%
Sterling Wrought.....
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....25%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₱ doz $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....20&10%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....60&3%
Acme, Nickeled.....50&3%
Walker's.....55&3%
Diamond Steel.....55&3%

Wringers, Clothes—

List March 11, 1889, 2% cash.

Wrought Goods—

Staples, Hooks, &c., list Jan. 12, 1886, 80&20@8⅓&25%

CURRENT METAL PRICES.

SEPTEMBER 4, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron :	
⅝ to 2 in. round and square.. 1 to 6 in. x ⅜ to 1 in.....	₩ ℔ 1.90 @ .. ¢
Refined Iron :	
⅝ to 2 in. round and square.. 1 to 4 in. x ⅝ to 1½ in..... 4½ to 6 in. x ⅝ to 1 in.....	₩ ℔ 2.00 @ 2.10¢
1 to 6 in. x ¼ and 5-16	₩ ℔ 2.20 @ 2.30¢
Rods—⅜ and 11-16 round and sq..	₩ ℔ 2.10 @ 2.20¢
Bands—1 to 6 x 3-16 to No. 12....	₩ ℔ 2.20 @ 2.30¢
"Burden Best" Iron, base price..	₩ ℔ 3.00 @ ....¢
Burden's "H. B. & S." Iron, base price.....	₩ ℔ 2 80 @ ....¢
"Ulster"	₩ ℔ 3.00 @ ....¢
Norway Rods	4.00 @ 5.00¢

Merchant Steel from Store.

	Per pound.
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots	2½¢
Best Cast Steel, base price in small lots	8 ¢
Best Cast Steel Machinery, base price in small lots	5¢

Sheet Iron from Store.

	Common American.	R. G.	Cleaned.
10 to 16	₩ ℔ 2.75 @ 2.80¢	3.25	@ ....¢
17 to 20	₩ ℔ 2.85 @ 3.00¢	3.25	@ 3.50 ¢
21 to 24	₩ ℔ 3.00 @ 3.10¢	3.50	@ ....¢
25 and 26	₩ ℔ 3.20 @ ..	3.50	@ ....¢
27	₩ ℔ 3.35 @ 3.37½¢	3.75	@ ....¢
28	₩ ℔ 3.50 @ .. ..¢	4.00	@ ....¢
	B. B.		2d qual.
Galv'd, 14 to 20,	₩ ℔, 4.50 @	4.38 @	....¢
Galv'd, 21 to 24,	₩ ℔, 4.87½ @	4.75 @	....¢
Galv'd, 25 to 26,	₩ ℔, 5 25 @	5.12 @	....¢
Galv'd, 27	₩ ℔, 5.62½ @	5.48 @	....¢
Galv'd, 28	₩ ℔, 6.00 @	5.85 @	....¢
Patent Planished	₩ ℔ A 10¢	B, 9¢	
Russia	₩ ℔ 9½¢ @ 10¢		
American Cold Rolled B. B.	₩ ℔ 5¢ @ 7¢		
Craig Polished Sheet Steel	₩ ℔, 8¢		

English Steel from Store.

Best Cast	₩ ℔ 15 ¢
Extra Cast	₩ ℔ 16½ @ 17 ¢
Swaged, Cast	₩ ℔ 16 ¢
Best Double Shear	₩ ℔ 15 ¢
Blister, 1st quality	₩ ℔ 12 ¢
German Steel, Best	₩ ℔ 10 ¢
2d quality	₩ ℔ 9 ¢
3d quality	₩ ℔ 8 ¢
Sheet Cast Steel, 1st quality	₩ ℔ 15 ¢
2d quality	₩ ℔ 14 ¢
3d quality	₩ ℔ 12½¢

METALS.

Tin.

	Per ℔
Banca, Pigs	23 ¢
Straits, Pigs	22½¢
English, Pigs	23¾¢
Straits in Bars	23¾¢

Tin Plates.

		Per box.
	Charcoal Plates.—Bright.	
Melyn Grade	IC, 10 x 14.. $5.75 @	$6.00
" "	IC, 12 x 12.. 6.00 @	6.25
" "	IC, 14 x 20.. 5.75 @	6.00
" "	IC, 20 x 28.. 12.00 @	12.50
" "	IX, 10 x 14.. 7.25 @	7.50
" "	IX, 12 x 12.. 7.50 @	7.75
" "	IX, 14 x 20.. 7.25 @	7.50
" "	IX, 20 x 28.. 15.00 @	15.50
" "	DC, 12½ x 17.. 5.50 @	5.75
" "	DX, 12½ x 17.. 7.00 @	7.25
Call and Grade	IC, 10 x 14.. 5.75 @	6.00
" "	IC, 12 x 12.. 6.00 @	6.25
" "	IC, 14 x 20.. 5.75 @	6.00
" "	IX, 10 x 14.. 7.25 @	7.50
" "	IX, 12 x 12.. 7.50 @	7.75
" "	IX 14 x 20.. 7.25 @	7.50
Allaway Grade	IC, 10 x 14.. 5.00 @	5.12½
" "	IC, 12 x 12.. 5.12½ @	5.25
" "	IC, 14 x 20.. 5.00 @	5.12½
" "	IC, 20 x 28.. 11.00 @	....
" "	IX, 10 x 14.. 6.00 @	....
" "	IX, 12 x 12.. 6.25 @	....
" "	IX, 14 x 20.. 6.00 @	....
" "	IX, 20 x 28.. 12.00 @	....
" "	DC, 12½ x 17.. 4.75 @	5.00
" "	DX, 12½ x 17.. 5.75 @	6.00
	Coke Plates.—Bright.	
Steel Coke.—IC, 10 x 14, 14 x 20..	$4.75 @	$5.00
10 x 30..	7.25 @	7.50
20 x 28..	9.75 @	10.25
IX, 10 x 14, 14 x 20..	5.50 @	5.75
BV Grade.—IC, 10 x 14, 14 x 20..	4.40 @	4.60
	Charcoal Plates.—Terne.	
Dean Grade.—IC, 14 x 20..	$4.35 @	$4.62½
20 x 28	8.75 @	9.25
IX, 14 x 20	5.40 @	5.62½
20 x 28	11.00 @	11.87½
Abecarne Grade.—IC, 14 x 20	4.25 @	4.50
20 x 28	8.45 @	9.00
IX, 14 x 20	5.25 @	5.50
20 x 28	10.50 @	10.80
	Tin Boiler Plates.	
IXX, 14 x 26	112 sheets	$12.50 @ $12.75
IXX, 14 x 28	112 sheets	12.75 @
IXX, 14 x 31	112 sheets	14.25 @

Copper.

Duty: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₩ ℔. Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.

Ingot.	
Lake	@ 13¼¢
"Anchor" Brand	@ 12½¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, May 23, 1889, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		20	20	20	21	22	23	26	28
30	72		20	20	20	21	23	25	29	....
36	96		20	20	20	22	24	28	30	....
36	96		20	20	21	23	25	29	31	....
48	96		20	20	22	24	26	30	....	....
48	96		20	20	23	25	27	31	....	....
60	96		20	20	25	27	32	....	....	....
60	96		20	21	26	....	....	....	....	....
84	96		21	22	....	....	....	....	....	....
84	96		22	23	....	....	....	....	....	....
Over 84 in. wide			23	25	....	....	....	....	....	....

All Bath Tub Sheets	16 oz.	14 oz.	12 oz.	10 oz	
Per pound	$0.53	0.25	0.27	0 30	

Bolt Copper, ⅜ inch diameter and over, per pound..... 20¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

	Per pound.
14 ounce to square foot and heavier	23¢
12 ounce and up to 14 ounce to square foot	24¢
10 ounce and up to 12 ounce	26¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each	8¢
Tinning sheets on one side, 30 x 60 each	30¢
For tinning boiler sizes, 9 in (sheets 14 in. x 60 in.), each	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each	10¢
Tinning sheets on one side, other sizes, per square foot	2½¢

For tinning both sides double the above prices.

Planished Brass and Copper.

14 x 48.

14 and 16 oz. and heavier..31¢. By the case...30¢ ₩ ℔
12 oz. and lighter.....33¢. By the case...32¢ ₩ ℔

24 x 48 and 30 x 60.

14 and 16 oz. and heavier..44¢. 12 oz.....37¢ ₩ ℔

Seamless Brass and Copper Tubes.

O. G.	N. G.	⅝	½	⅜	¼	⅛	1	1½
8-14	6-12	35	31	28	27	26	25	22
15	13	36	31	29	28	27	26	23
16	14	37	32	30	29	28	27	23
17	15	38	33	31	30	29	28	24
18	16	40	34	32	30	29	28	25
19	17	41	35	33	32	31	30	27
20	18-19	42	37	35	34	33	32	29
21	20	44	39	37	36	35	34	32
22	21	46	40	38	37	36	35	34
23	22	48	42	40	39	38	37	37
24	23	51	44	42	41	39	38	39
25	24	54	47	44	43	42	41	43

Copper, Bronze and Gilding Tube, 2¢ ₩ ℔ additional.

Brazed Brass Tubing. (To No. 20, inclusive.)

Above 5-16 inch to 3 inch, inclusive	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	1.50
Fancy Tubing, Brass, to No. 20, inclusive	43¢ ₩ ℔
bronze Tubing, 3¢ ₩ ℔ more than Brass.	
Discount from list	25 @ 30 %

Roll and Sheet Brass.

Discount from list..... 25 @ 30 %

High Brass Rods.

Over 1 inch diameter	27¢
¼ inch to 1 inch diameter, both inclusive	24¢
No. 8 and less than ¼ inch diameter	26¢
Smaller than No. 8	30¢
Hexagon, Octagon and Square, 2¢ ₩ ℔ advance over Round Rods.	

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 ℔.

Western Spelter	5½¢ @ 6¢
"Bergenport"	8¢
"Bertha"	7¾ @ 8¢

Zinc.

Duty: Sheet, 2½¢ ₩ ℔.

600 ℔ casks	6½¢
Per ℔	7¾¢

Lead.

Duty: Pig, $2 ₩ 100 ℔. Old Lead, 2¢ ₩ ℔. Pipe and Sheets, 3¢ ₩ ℔.

American	4½¢
Newark	4½¢
Bar	4½¢
Pipe, subject to trade discount	6 ¢
Tin-Lined Pipe, subject to trade discount	15¢
Block Tin Pipes, subject to trade discount	45¢
Sheet, subject to trade discount	6¾¢

Solder.

½ @ ½ (Guaranteed)	14½¢
Extra Wiping	12½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson	₩ ℔ 19¢
Hallett's	" 17¢

Fittings.

Cast Iron Fittings, Black and Galvanized	75&10 %
Cast Iron Fittings, Bushings and Plugs	80 %
Cast Iron Fittings, Flanges	75&10 %
Malleable Iron Bushings	80@80&5 %
Malleable Iron Unions	70@70&5 %
Malleable Iron American Unions	55 %
Malleable Iron Unions, Keystone	55 %
Wrought-Iron Nipples	75&10 %
Wrought-Iron Couplings	70 %
Wrought-Iron Long Screws	70@70&5 %
Casing Fittings	60 %
Malleable Iron Fittings	40@40&5 %

Valves, Cocks, &c.

Iron Body Valves	70 %
Throttle Valves, Iron Body	70 %
All-Iron Valves	65 %
Compression Gauge Cocks	60 %
Mississippi Gauge Cocks	60 %
Register Gauge Cocks	65@65&10 %
Air Cocks and Radiator Air Cocks	65@65&10 %
Steam Gauge Cocks	60 %
Oil Cups, Plain, Elbow, new pattern, T and Lever Handle	65@65&10 %
Globe Oil Cups	55 %
Common Lubricators	65@65&10 %
Lubricators with Air Cocks	65@65&10 %
Iron Body Lubricators	60 %
Steam Whistles	65 %
Whistle Valves	65 %
Water Gauges	65 %
Brass Expansion Joints	55 %
Pump Valves	55 %
Soldering Unions	65 %
Soldering Nipples	70 %
Brass Unions (Union Joints)	65 %
Radiator Nipples	60 %
Fusible Plugs	60 %
Oil Pumps	55 %
Self-Acting Air Valves	65 %
Vacuum Valves	55 %
Steam Swing Joints	55 %
Iron Strainers	55&10 %
Jenkins' Iron Body Valves, except Gate Valves	60&10 %
Jenkins' All-Iron Valves, except Gate Valves	60 %
Jenkins' Iron Body Gate Valves	55 %
Jenkins' All-Iron Gate Valves	55 %
Iron Cocks, all Iron	65 %
Iron Cocks, with Brass Plugs	65 %
Brass Globe, Angle and Cross Valves	65 %
Brass Globe Valves, Finished	45 %
Brass Globe and Angle Valves, hose outlet	65 %
Brass Garden Hose Valves	65 %
Brass Caps for Hose Valves	60 %
Brass Horizontal, Vertical and Angle Check Valves	65 %
Brass Safety Valves	65 %
Brass Safety Valves, low pressure	65 %
Brass Safety Valves, low pressure, with balance weight	65 %
Brass Butterfly Valves	55 %
Brass Throttle Valves	55 %
Brass Radiator Valves	65 %
Brass Radiator Valves, Jenkins'	65 %
Brass Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves	65 %
Brass Jenkins' Gate Valves	50 %
Brass Steam Cocks	60 %
Brass Gas, Meter and Union Meter Cocks	60 %
Brass Fittings, Rough	60 %
Brass Fittings, Finished	25 %
Brass Bushings	60

Plumbers' Brass Work.

Ground Key Work, Rough	60 %
Ground Key Work, Finished	55 %
Compression Work	60@60&5 %
Compression Work, Grundy, Heavy Pattern	55 %
Chain Stays	60 %
Basin Plugs	60 %
Sink or Bath and Wash Tray Plugs	60 %
Basin Clamps	55 %

FRENCH GLASS.

Per Box 50 feet.

Sizes		Single. 1st.	2d.	3d.	4th.
		E F H	I E H	H H	H B
25	6 x 8 to 10 x 15	$10.50	$9.00	$8.50	$8.00
40	11 x 14 to 16 x 24	11.50	10.75	10.25	9.75
50	18 x 22 to 20 x 30	15.50	14.00	13.00	12.50
54	15 x 36 to 24 x 30	16.50	15.00	13.50	....
60	26 x 28 to 24 x 36	17.75	16.25	14.75	....
70	26 x 36 to 26 x 44	19.00	17.50	15.25	....
80	26 x 46 to 30 x 50	21.00	19.50	17.00	....
84	30 x 52 to 30 x 54	22.00	20.25	18.00	....
90	30 x 56 to 34 x 56	23.00	21.25	19.00	....
94	34 x 58 to 34 x 60	24.00	22.75	21.00	....
100	36 x 60 to 40 x 60	26.50	24.50	23.00	....